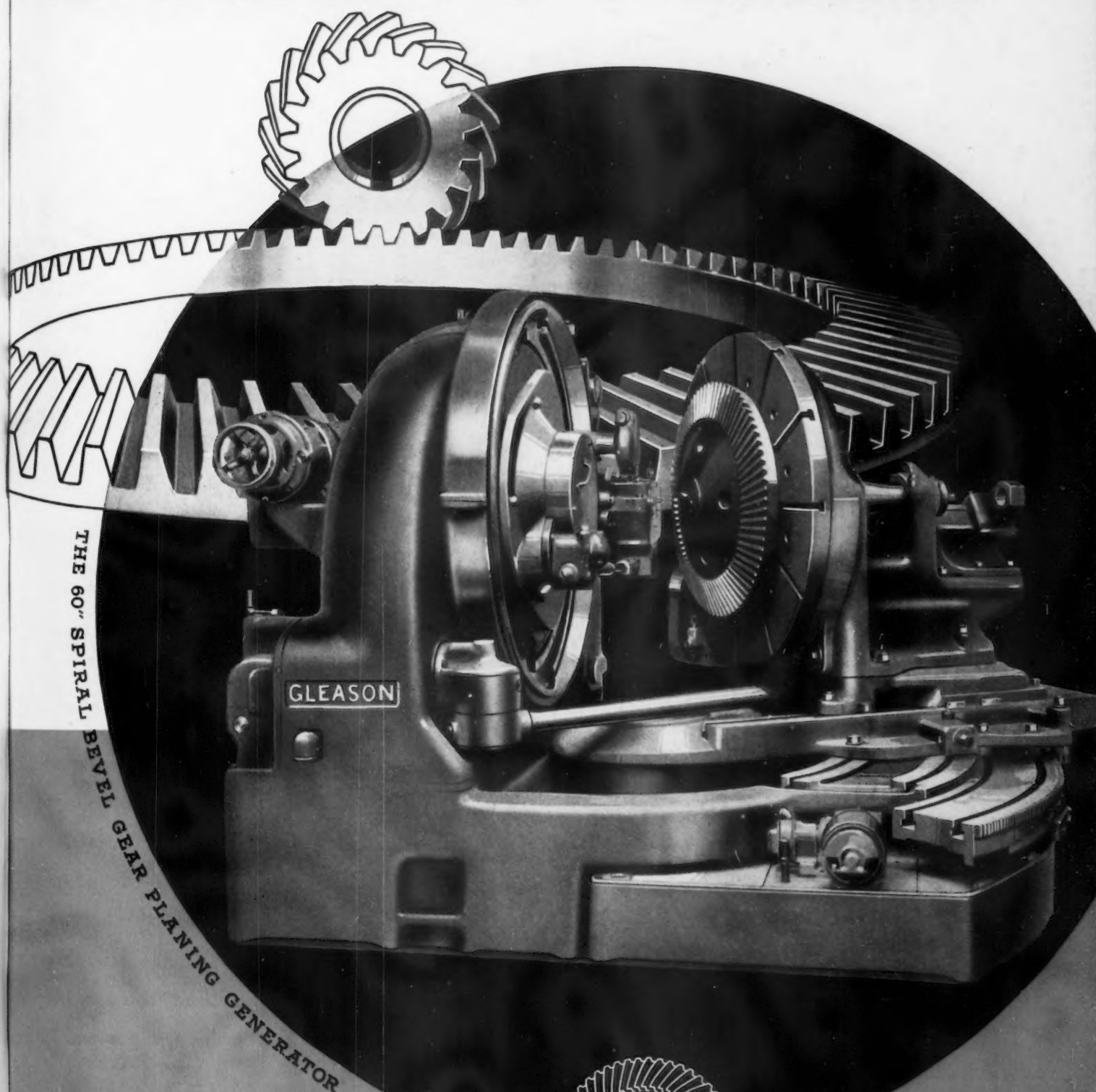


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THE IRON AGE

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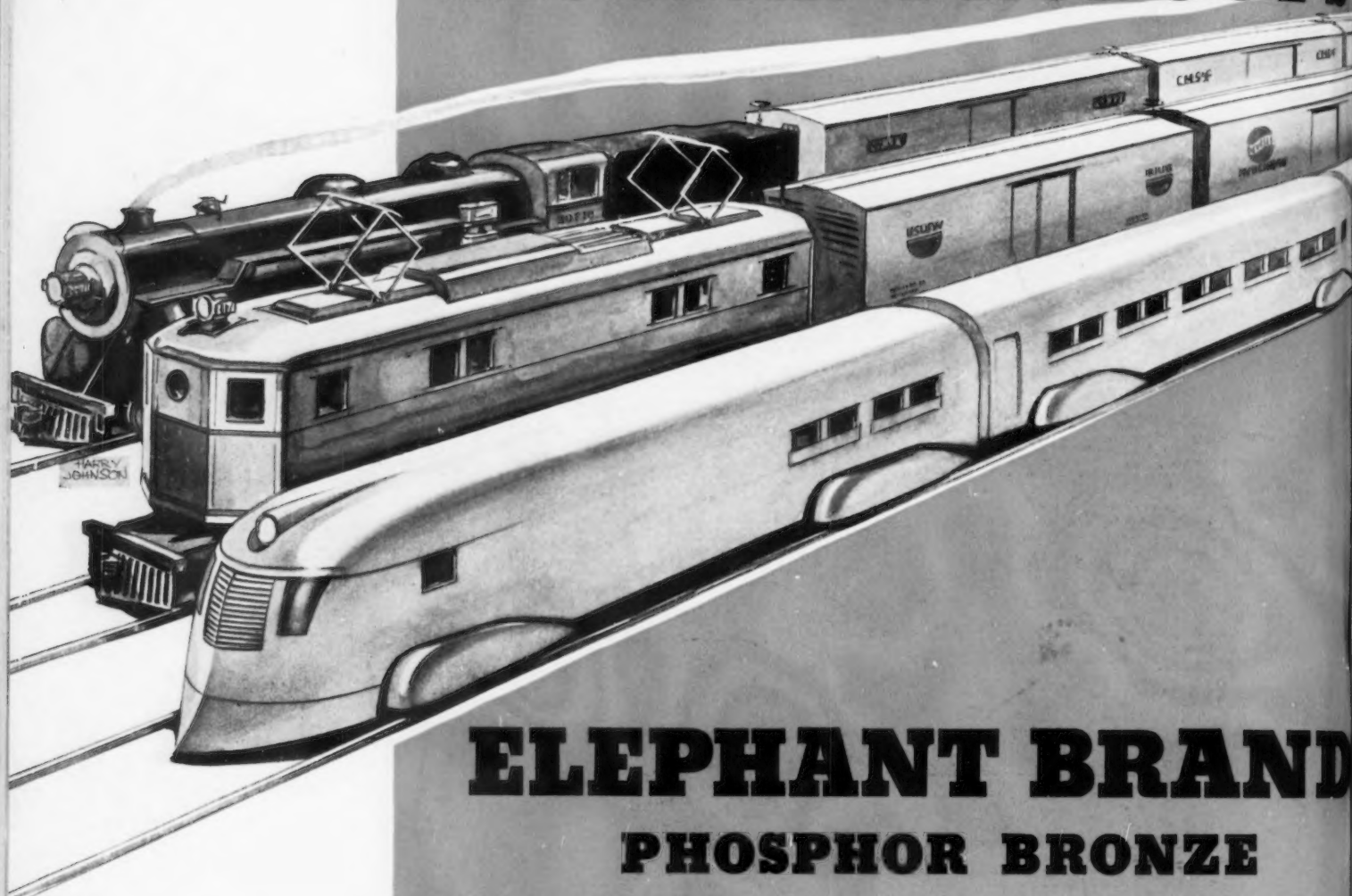


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ADVERTISING STAFF

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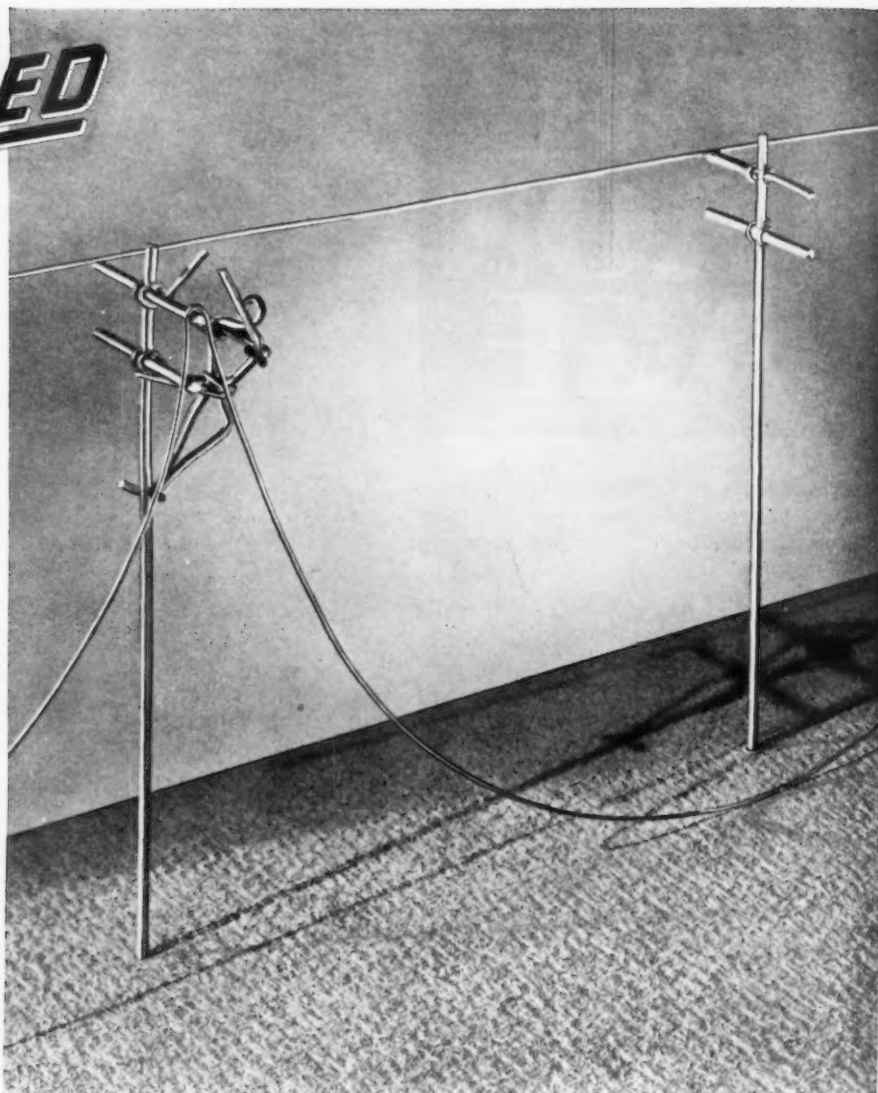
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▲▲▲ THE IRON AGE ▲▲▲

MARCH 26, 1936

ESTABLISHED 1855

Vol. 136, No. 13

No Politics in These Projects ...

THE Florida ship canal project and the Passamaquoddy tidal project have encountered hard sledding. The military affairs committee has refused to include appropriations for them in the budget; "Honest Harold" is not keen for them; nobody seems to want them very much except the President.

Irrespective of the fact that coastal shippers have said rather unanimously that they would not use the big ditch across the southern peninsula and that there is little enthusiasm for it in military or naval circles, we can see some advantages in this project. One is that it would stimulate the sale of steam shovels and dredges; another is that residents of the interior would not have to take the journey to Gulf or Atlantic coast points to go fishing. One might sit on its banks and catch stray tarpon from the former or sailfish from the latter.

Passamaquoddy, too, does not seem to have many friends outside of the White House, if we except the laborers on that project for whom "love seats" were bought recently by their kindly Government. Critics say that Maine has no need for the extra power and that, in addition, the investment in damming the tides would be so great that the project could never pay itself out.

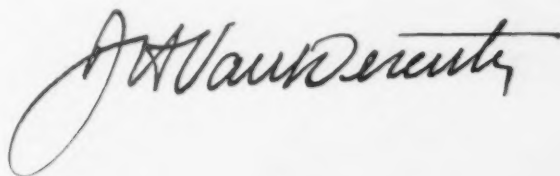
All of which has given rise to the canard that these projects are being pushed for political purposes.

It is not often that we come to the defense of the present Administration, but a sense of fairness impels us to do so this time.

The cost of the Florida big ditch is put at \$140,000,000. There were less than 270,000 votes cast in Florida for both major parties in 1932. One hundred and forty thousand votes divided into one hundred and forty million dollars would amount to one thousand dollars each if all of them were purchasable. Of course, they are not and the few that could be bought could doubtless be had for much less than \$100 apiece.

As for Maine, it is doubtful if even 10 Passamaquoddy projects could alter its rock-bound Republicanism. Mr. Farley knows that as well as any one.

No, there is no sinister political purpose in either of these projects. They are just more New Deal damfoolishness.



"It Can't Happen Here!"

WISCONSIN has long been an economic guinea pig for the social experimenters. Even before the advent of the New Delirium this state, favored by Nature but abused by men, had become infested with the taint of radicalism. Today, Wisconsin is a hot-bed of socialism, communism, laborism and all of the other "isms" which run

the color gamut from pale pink to blood red.

Having sown the wind, Wisconsin is now reaping the whirlwind. The storm is blowing its industry and its workers' jobs out of the state, to take root and thrive in more favorable environment. Deserted factories, with windows smashed by unruly mobs are being torn

down by wrecking crews. Homes are becoming vacant and stores unoccupied.

The important thing is not the mess in which Wisconsin finds itself, nor is it the advantages which have accrued to other neighboring states. The thing of moment is that manufacturers and workers in other states shall profit by her experience and guard against sharing it.



WISCONSIN'S disturbing decline as an industrial center can be attributed directly to a combination of unwise legislation, hampered justice, and breakdown of administration. Other contributing factors are, the growth of socialism (some even refer to it as communism), prejudice against employers, careless and unwise selection of lawmakers and administrators, and legislative experimentation which does not so much as take a middle course by encouraging industry, but invariably promises the moon to a section of the population and thereby lays the foundation for malicious class consciousness.

Evolution of a condition such as exists in Wisconsin is always slow. A wedge is driven in here and one there until finally in a few years irreparable damage has been done, and it is damage of a kind that cannot be easily repaired. The step by step breakdown comes so slowly that it has its tentacles securely fastened before citizens and industry realize its full significance. Class prejudice slowly forces itself between employer and employee and the general public usually sleeps on unaware of the devastating effect upon social and economic life and the grim reality

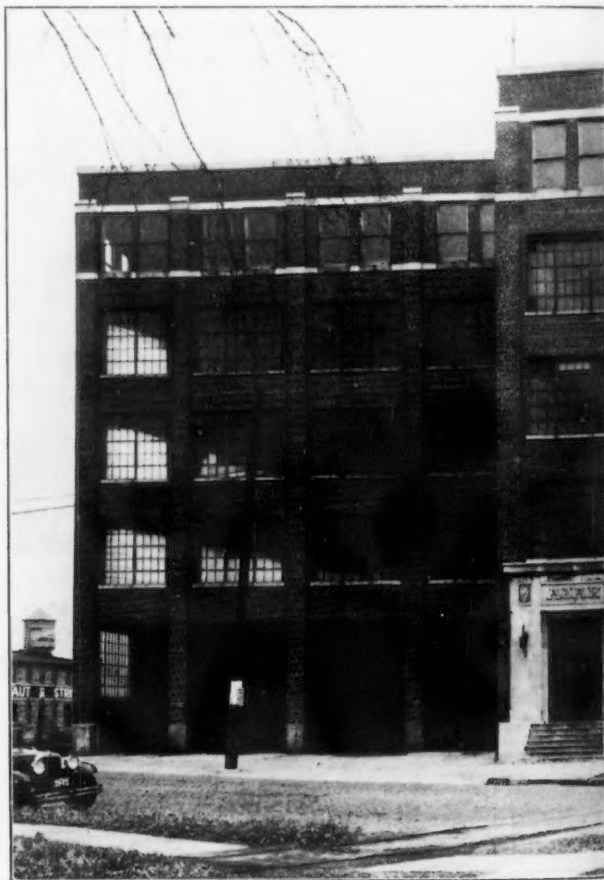
that the effects are certain to reach into the humblest home.

Wisconsin's story can be told and its example cited. What of the other 47 States in the union? Many of them are profiting for the moment at Wisconsin's expense but can all of them feel secure that the same insidious moves are not now under way within their own borders? The subject will bear study not alone by manufacturers but by an aroused citizenry.

There is no sane reason why Wisconsin should not be

prosperous industrially and why it should not more than hold its own with the industrial growth of the

▲ ▲ ▲
THIS structure is in the hands of a wrecking company.
▼ ▼ ▼



But It Has Happened in Wisconsin

By ROGERS A. FISKE
Western Editor, THE IRON AGE

▲ ▲ ▲
THE building at right, vacated by industry, may be used as a warehouse and as such employment is reduced to the minimum.
▼ ▼ ▼



country. It has natural resources, an aggressive people, fine industrial sites, and adequate markets. It needs only to be taken out of the political laboratory and to be put on a practical economic basis. Manufacturers have known this for many years and it now begins to appear that the people of the state are recognizing that a noisy minority of politicians and labor leaders have been greedily sapping the industrial life of the state.

The Wisconsin State seal depicts the industrious badger. It has been suggested before the legislative that the badger be re-

placed by a guinea pig—the symbol of experimentation. Even official Washington appreciates the suggestion for at a national conference of labor legislation held in February, 1934, in the national capitol a federal official was quoted as saying, "Wisconsin has been a guinea pig before so that doesn't matter." Again on the pathetically humorous side of the question was the farmer legislator who when he heard read a pharmacy bill declared that he "was for anything that would help the farmer." And again during the discussion of a proposed tax bill a legislator from a rural com-



It frequently happens that when an industry disappears the buildings are wrecked. ▲ ▲ ▲

munity could see nothing but good in the bill because "in the morning's newspaper he had seen where one of Wisconsin's largest industries had received an order amounting to \$100,000, and therefore the company could stand the extra tax load." He was totally ignorant of the fact that such an order was actually small for the company in question.

Costly Experimentation

These matters of prejudice in legislation invariably result in excessive tax loads and restrictions on industry which become so burdensome that new industry will not enter the state, old industries move out and the only profit in the entire situation is to communities outside of Wisconsin that offer industrial freedom which the Badger State takes away.

Witness the evolution of the Wisconsin unemployment insurance act, under which employers had at least two securities, (1) a five year contract with the state, and, (2) maintenance of their own reserve funds. A revision attempts to bring the Wisconsin law within the so called standards of the National Social Security Act and now Wisconsin manufacturers are faced with (1) loss of opportunity to use and to conserve reserve funds through true economic management, (2) unwarranted increase in the number of employees placed under the unemployment reserve, (3) an unnecessary increase in the contribution rate, or payroll tax, which may reach as high as 4 per cent by 1938, and, (4) elimination of the five year contract. The reserve funds will pass into usually



A PLANT such as this should, under normal conditions, be eagerly sought after by industry. ▲ ▲ ▲

extravagant and incompetent political hands and many employees whose placement is not justified will come under the act. Having given up rights under the old law, Wisconsin manufacturers will not be able to retrace their steps should the National Security Act prove to be unconstitutional. They will once again be left in circumstances not compatible with other states.

Another point showing the attitude of Wisconsin in regard to its unemployment law is that it not only enacted the law and made the tax payable from July 1, 1934, but the rate is 2 per cent, whereas the Federal rate is 1 per cent from Jan. 1, 1936. Other states in enacting similar legislation have been following the rate prescribed by the government, the State of Washington, being a possible exception.

Once again Wisconsin business is loaded with an additional burden.

A Club Over Industry

But, it is not necessary to go as high as the state legislature for anti-industry regulation for Milwaukee has the Boncel ordinance which permits either the mayor or chief of police to close any factory where 200 or more persons cause a continued disturbance. This is a club over industry because the "200 or more" need not be employees of the closed concern but merely a crowd recruited by agitators from people on relief to which will be attracted professional bums and thugs.

There are many in Wisconsin who charge this ordinance is actually acknowledgment of refusal

by public officers to take full responsibilities of their offices. It is nothing more than abdicating to the lawless, and if permitted to stand it can be nothing more than a screen for political inefficiency and indifference, or more bluntly it can easily be turned into political cooperation with the lawless and hoodlum elements.

Let a Milwaukee manufacturer tell his own story. "The attitude of the city government here is unfavorable to industry. That is another reason why, when we decided to buy a plant, we decided to buy one outside the state. The

Boncel ordinance expresses what we mean."

Flouting the Law

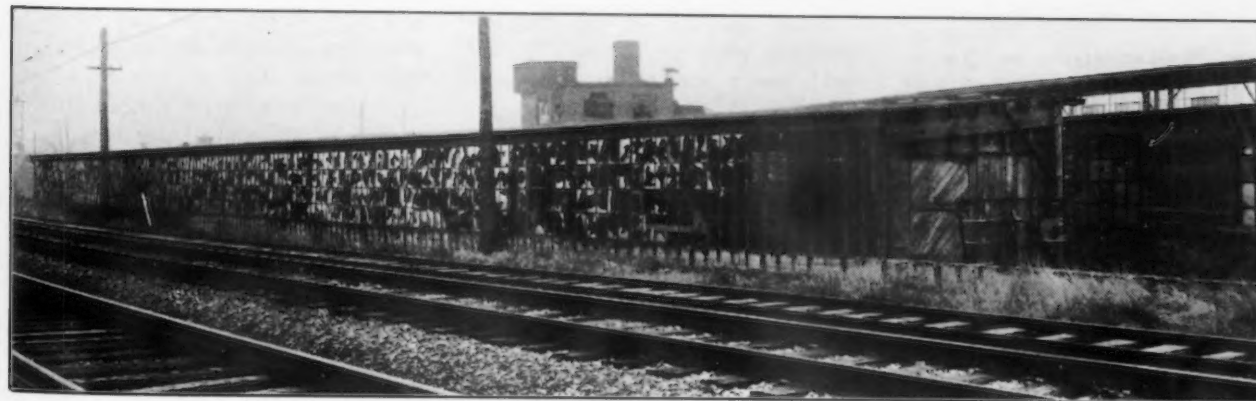
Usually at the first turn of industrial strife the administrative branch of a state government can be counted on to protect life and property. Not so in many Wisconsin communities, as for example at Racine when during the Case strike the police and county law reinforcement officers were held motionless by political maneuvering and, with lawlessness ruling, not a state militiaman set his foot on the scene of strife. Public officials were so brazen in their neglect of duty as to ignore a court injunction. A labor leader was permitted to carry a gun. More recently for 15 weeks, officials and office workers at one plant were evicted and blocked from their desks by strikers and neither United States government reports, nor those to the in-

dustrial commission of Wisconsin on industrial reserves could be made. The company's books were not accessible for drawing off the payroll. This strike revolved around four workers and it serves as an example of what happens when local officials, and for that matter state officials, abet a militant union organization. This strike is now settled, or so it appears on paper. The facts are that the company involved has established a branch (in another state) which may soon become the parent organization. Check up another industry soon lost to Wisconsin! Furthermore, though the strike is settled the plant strike committee is still bitter and high handed and the whole situation is at rest on a powder keg.

After all, what are the real effects of these conditions? Wisconsin loses industry and communities lose employment. Unused manufac-



THIS vacant structure can be seen from the mayor's office at Racine. Eighteen hundred workers formerly earned their wages here. ▲ ▲ ▲



▲ ▲ ▲ **VANDALISM** accounts for much destruction to idle industrial buildings.

turing buildings stand as specters, vacant homes appear and many store buildings are not occupied. Merchants feel the loss of purchasing power in the community, workmen lose their homes and many rents are not collectible. The tax and community welfare burdens of the employed grow heavier.

A Vicious Spiral

The removal of one industry means that its neighboring industries lose business. Shops making tools, jigs and fixtures find orders lighter, local foundries and pattern shops get less work, parts makers suffer and the heavy hardware trade drops. And, of great importance is that lost industry is no longer taxable but the tax eaters demand their pound of flesh and the tax rate is increased for those who remain because political groups must be fed and they will not subsist on part rations.

The net effect of the entire Wisconsin program is to tear down the industrial structure for the benefit of other states. It is, for instance, a matter of record that when an out-of-state plant has been acquired as a subsidiary by a Wisconsin company, almost invariably the Wisconsin plant sooner or later closes and moves to the other state.

One plant moved from Chicago to Wisconsin, stayed one year and moved back to Illinois. A company with plants in Wisconsin, Eastern Canada and New York had decided to move the New York plant to Wisconsin, but unfavorable conditions there caused a change of plans and the Wisconsin plant has only a skeleton force and Wisconsin residents fear even that will be removed. Eastern bankers said, "not one cent to help a Wisconsin firm," which moved to the Carolinas where it has been successful.

Industry Moves Out

The Walker strike at Racine caused the company to buy and operate a plant in Jackson, Mich., in order "to find manufacturing facilities outside of Wisconsin to meet customer's demands and to save the business from complete destruction." The Bear brand hosiery plants at Beaver Dam and Waupun were closed and moved to Illinois despite the efforts of the union and the defunct NRA. At Beaver Dam annual wages amounted to \$325,000 and 383

were thrown out of jobs. Unemployment at Waupun was raised by 400. A Boston concern moved out of Racine County and bitterly assailed Wisconsin and the county. The annual payroll loss was \$300,000 and 275 jobs evaporated in a community that had practically no other support. It is interesting to note that this community changed its name but the stigma remains.

Since 1930, according to figures published by the Milwaukee Sentinel, Milwaukee and county have lost 13 industrial plants which had payrolls totaling \$8,461,000 and which employed 8095 workers. It is a fact that still others plan to move. Records of new corporations operating in Milwaukee in 1933 disclose total payroll of \$420,000 and 339 workers. The 1934 record is less favorable. The return of beer, with all its ramifications, falls short of making up the loss due to firms that are no longer in Milwaukee.

Milwaukee Shoes Walk Out

The Milwaukee area once prided itself as being a major shoe manufacturing center. A total of six companies either have moved or intend to move and their loss means \$4,000,000 in payrolls and 3600 jobs. The factors governing this situation are growth of radical socialism, communism and consequent strikes as well as higher costs of doing business. Under NRA union membership grew from about 14 to 4000. The result is that while Milwaukee formerly produced 30,000 pairs of work shoes a day it is now said to make less than 5000 pairs. These losses are not a product of a long stretch of time but rather most of them have taken place since 1920. In other words, this unfavorable change in Wisconsin coincides with the craze for so-called social reform and experimentation.

What becomes of the factory building when an industry moves out? Under normal circumstances

the local association of commerce can immediately start work to bring to its town a new industry and the unoccupied buildings can and should be one of the valuable inducements. Not so in Wisconsin. Many manufacturers have moved out and razed the old plants. Because of industry's lack of interest in that state many structures stand vacant to be slowly demolished by vandals. A few are used for warehouses which can hope to employ only a very small percentage of the workers needed for manufacturing operations. Some buildings are being dismantled and actually shipped for erection in other states.

Vacant Buildings Multiply

The importance of lost industry, and inability to regain industry, to small communities is often a matter of life or death to its business. In ten small manufacturing towns in Wisconsin there are 22 vacant industrial buildings. Sheboygan has four of these and the industries that formerly occupied them have moved to Indiana, Kentucky and Minnesota. Beaver Dam, Evansville, Janesville, Jefferson, Merrill, Oconto, Portage and Rice Lake constitute only part of a long list of the smaller cities and towns that are suffering under existing conditions. In 10 years Racine has lost 6000 jobs due either to failures or movement in whole or in part from the state. From 1929 through 1934, Racine lost \$3,855,000 in payrolls and 3095 jobs.

What can the lawful citizens of a community be thinking when a chest drive for \$90,000 fell short of the mark because of threats by labor leaders who had extracted \$500 from merchants to subsidize strikers? One wonders if the citizens knew that of the money raised \$71,000 came from industry and only \$3,800 from merchants who were cowed by threats of boycotts, etc.

How many level headed citizens of the state know how insecure much of the industry is which still remains there. Here is what one manufacturer says, "If we do move it will not be to another city in Wisconsin but probably to Michigan or Canada. The general tax situation in Wisconsin when viewed with Michigan is not favorable." His company is assessed at \$700,000 and his payroll is \$250,000 an



nually. He employs 350. A hosiery concern now has manufacturing agreements with two Southern plants. Some companies while expanding in Wisconsin are also expanding in other states — this avoids open criticism. A Wisconsin concern built a branch in Canada to save export duty to England and because of tax and other conditions in Wisconsin. There certainly is no real assurance that

situation and in that theirs is a seasonal business, they had to make hay while the sun shines and they could not take chances on the labor situation at this time. We had previously assured them that we have gone through this situation but the recurrence of the Nash situation and the rather unfair situation that developed at the ——— plant has tended to destroy all faith that they had in us."

Then there is the following extract from a letter:

ing newspapers which went on to say that communists have centered on Racine industries and that they have all but wrecked some of them. A weakened official municipal spirit and policy allowed these vultures of the Soviet to gain control of industrial activities. The editorial went on to say that "It (Racine) will find that it will pay a terrible price for its experience with Communism. Just what it does pay

WEATHER
 Forecast for Racine
 Weather service, Page 2

JACKSON CITIZEN PATRIOT

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Toy Named to Supreme Bench Machinery To Be Installed; Deal Is Closed

Elevated
Milk Handling
Bengel Lancers Enter Mayoralty Campaign

Cost Attacked
Group

JACKSON, Mich., extends open arms to an industry which because of a strike at its Racine plant was forced to establish manufacturing facilities where it could operate unmolested and to better advantage. ▲ ▲ ▲

concerns like the above will not fold up their tents and move away.

Typical Reactions

Reactions on the part of business men outside of Wisconsin are shown by the following letters:

"At a meeting in Chicago, which was attended by a representative of this company, one of the representative manufacturers came to our representative and said that there had been a general discussion in their meeting regarding the situation in Wisconsin concerning labor and the general manufacturing situation. He stated it was the attitude, at least as expressed by the discussion during this open meeting before our arrival, that it was unsafe to place business in the state of Wisconsin; that on account of the unemployment insurance act in the State of Wisconsin where we add 2 per cent of the direct labor to the cost of the product, or, if you please, we absorb this from our profit or estimated profit, that they felt it was going to impose a penalty on them as manufacturers of completed products.

"As I have previously informed you, we personally, have lost approximately \$150,000 of business to the State of Minnesota to a concern who previously assembled parts and are now going to make the entire job themselves. They do not feel secure in our labor

"I have had brought to my attention on a number of occasions, by outside people while visiting Detroit, Cleveland and various other cities, conditions in Racine—conditions of rather serious nature affecting our own price situation and business transactions.

"An example of what an officer of a manufacturing company at Indianapolis heard about the Racine situation was put before me Wednesday the 14th, when I was at Indianapolis visiting the plant of the ———. We were engaging in conferences on prices ——— when a statement was made by the treasurer of the company, who was in this conference, that they did not intend to pay a long price ——— because we had labor trouble in Racine and because we had to deal with strikes."

Often statements about the Wisconsin situation cannot be taken as adverse publicity because the secret is long since out and the mark is there. The nation is interested as is evidenced by an editorial "Moscow to Racine" originally published in a Wisconsin newspaper and republished from coast to coast.

"Racine Tolerated Communists—Let Others Watch Result" was a headline in one of Wisconsin's lead-

should interest other cities that have been and are too friendly toward destructive radicals."

The kick back has been violent enough so that every possible inducement has been, and is still being laid before Wisconsin manufacturers to leave that state and take up residence where conditions are more favorable. Chambers of Commerce go shopping for industries in Wisconsin. Delegations from other states call on Badger State employers who are also bombarded by letters making attractive bids for relocation.

"Come on Over and Get Out of the Rain"

Cities outside of Wisconsin send real estate agents, and representatives of civic groups to launch vigorous campaigns to draw industries from the Badger State, and the most effective arguments are always those which draw sharp contrast between conditions in Wisconsin and in other states. What are the inducements to move? Freedom from the cloud of politi-

(CONCLUDED ON PAGE 115)



Burden Water Wheel, 1851.

Will Cooke

This Water Wheel

o o o

By O. A. VAN DENBURGH, JR.
Secretary, Burden Iron Co.

o o o

chines. This, however, took comparatively little load from the water wheel, and it is understood that the sole object of this installation was flexibility. In 1896 all operations were finally removed to a new steam powered mill on the Hudson River after which the wheel was abandoned, finally to be dismantled and scrapped.

In 1914, Mr. F. R. I. Sweeney, then a civil engineering student at the Rensselaer Polytechnic Institute, calculated the power characteristics of this wheel. His work was published in the 1915 Transactions of the American Society of Civil Engineers, Vol. 79, Page 708, and included photographs, detail drawings and curves. The power and efficiency curves are reproduced here. Neglecting gear efficiencies, and assuming sufficient water to initially fill the buckets, a maximum of more than 1000 h.p. was available.

The efficiency curve, while perhaps generally typical of all overshot wheels, seems nevertheless quite remarkable, both for its characteristic flatness and for its value, 84 per cent at light loads and 80 per cent at 1000 h.p. For comparison, the efficiency curve of a modern 1000 h.p. hydraulic turbine has been superimposed on Mr. Sweeney's curve.

Above 55 per cent of rating, the efficiency of the turbine exceeds

broken journal dropped the immense structure into the wheel pit. There seems to have been other difficulties of a less serious nature. After thirteen years' experience with this wheel, Mr. Burden redesigned and rebuilt it. This was in 1851. The improved and rebuilt wheel is here illustrated.

With only ordinary repairs and maintenance, it operated successfully for forty-five years. The early connected load consisted of the following:

- 1—Rotary squeezer for muck balls.
- 1—Muck Mill—2—19 in.—2 high stands.
- 4—Rolling Mill trains for horse shoe rods—2—9 in.—3 high, 1—9 in.—2 high.
- 1—Rolling Mill train for rivet rods—2—9 in.—3 high, 2—9 in.—2 high.
- 6—Horse Shoe cutting and forming machines.
- 42—Small presses for punching nail holes in horse shoes.
- 15—Rivet Machines, hand fed. Roll shop, shears, blowers and small machine.

Later, one engine was purchased to drive five of the horse shoe ma-



THE original works of the Burden Iron Co., established at Troy, New York, in 1812, were located on the Wynants Kill about one-quarter of a mile from where this stream empties into the Hudson River. This stream, with a 70 ft. fall available at the works, supplied all operating power by means of small overshot water wheels. In 1838, when power requirements reached a point where five small wheels were necessary, Henry Burden designed and built one large wheel. This wheel, 60 ft. diameter by 22 ft. wide, replaced all of the smaller units.

It operated from 1838 until 1851, but not without difficulties. Records indicate that on one occasion, a

Wheel Did Business When Grandpa Was a Boy

that of the wheel, reaching, at rating, a 12 per cent better value. Below 55 per cent of rating the advantage, as far as efficiency is concerned, is entirely with the wheel.

The construction of this wheel was interesting. The hub was of a squirrel cage design. A cast iron flange or spider at each end was provided with six holes on a 7 ft. circle. Into these holes, wrought iron bars and cast iron separators were fitted and keyed. These spaced the end flanges to the proper width of wheel. There was no central shaft but a cast iron journal, 20 in. diameter x 19 in. long was cast integral on each flange. Around the circumference of the flanges, holes were provided for a total of 264-1½ in. diameter wrought iron rods or spokes. Some of these were placed radially and some at an angle to the axis. The latter, like spokes in a bicycle wheel, provided axial rigidity. Tension in all spokes was adjustable by nuts or turnbuckles. The outer ends of the spokes passed through the face or flooring of the wheel, which was 55 ft. 9 in. diameter and made of 10 in. x 10 in. Georgia pine timbers, 22 ft. long.

Thirty-six buckets were built on the face of this wheel, the flooring forming the backs of the buckets. The fronts were of 2 in. Georgia pine braced and shrouded with light cast iron sections. The front curved inward on a 10 ft. radius so as to meet the flooring at a bucket depth of 5 ft. 9 in. These buckets were 20 ft. long and at the top were 19 in. wide. The latter dimension diminished to zero at the bottom.

Water, supplied through a 5-ft. penstock located across the top of the wheel, was distributed across the face of the wheel and directed tangentially into the buckets by means of four rectangular orifices.

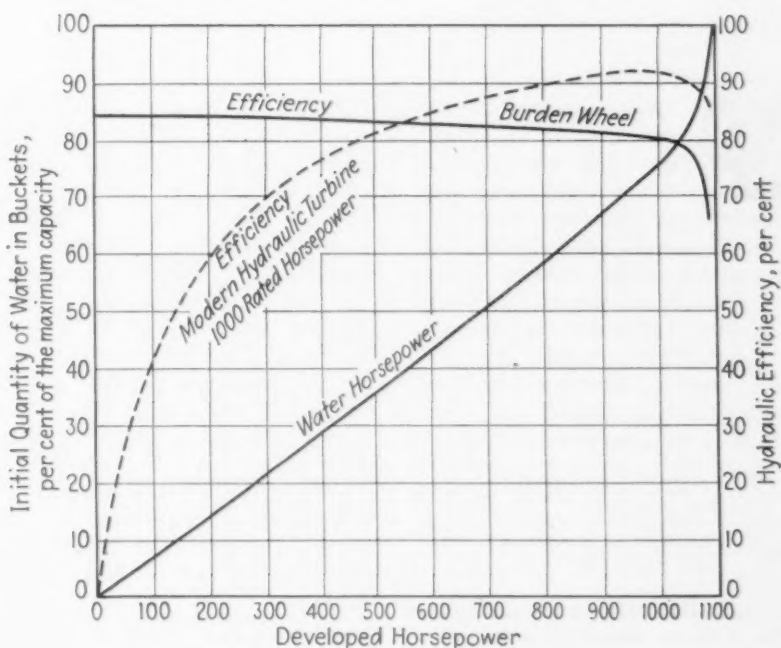
MOST of the material appearing in our columns is in the nature of current events, as is to be expected in an industrial newspaper. Occasionally, however, it is interesting and instructive to turn the calendar back and see how things were done in our industry many years ago.

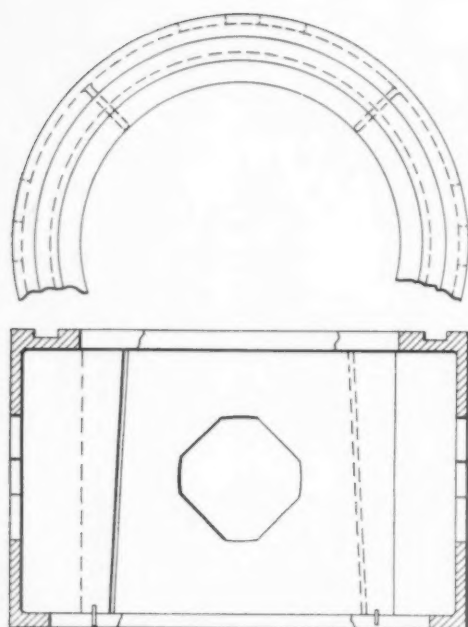
In this instance we present a water wheel that did business when grandfather was a boy. And grandfather knew his business too, judging from the efficiency curve of this old timer as contrasted with a modern hydraulic turbine of similar capacity.

The orifices were equipped with adjustable gates, all of which were mechanically connected and controlled through gearing by a single hand wheel. The normal speed of 2½ r.p.m. was maintained by hand, there being no automatic governor.

Power was taken off at the periphery of the wheel. Six-foot gear segments 9 in. wide were mounted around the circumference at either edge of the facing, forming the equivalent of two huge gears of 56-ft. 4-in. pitch diameter. These meshed respectively with 7-ft. diameter gears on a common 12-in. diameter shaft supported by pedestals on the mill floor. At normal speed, this shaft turned at about 20 r.p.m. This speed was further increased through a 16-ft. gear which drove a 44-in. pinion on a jack shaft. The latter was equip-

(CONCLUDED ON PAGE 115)

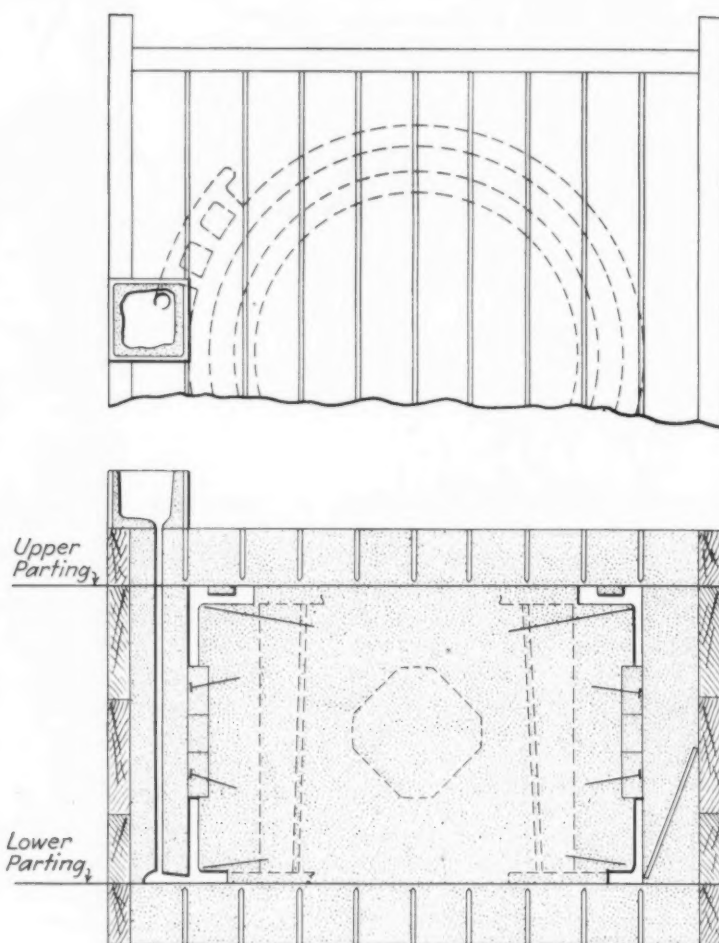




ABOVE
FIG. 1—Tire machine stand
casting.

o o o

AT RIGHT
FIG. 2—Tire stand molded by
risky double rollover method.



Simplifying the Complicated Mold



IN the face of a decided measure of nepotism, an order was secured for a respectable tonnage of gray iron and semi-steel castings to meet the requirements of a rubber goods concern. Taken at a flat rate per pound, and being of a decidedly mixed variety both as to weight and design, the castings provided certain hazards which it was necessary to overcome without complaint, particularly since the customer's pattern-maker, given "carte blanche," held opinions which had prevailed in a neighboring foundry for some time previously.

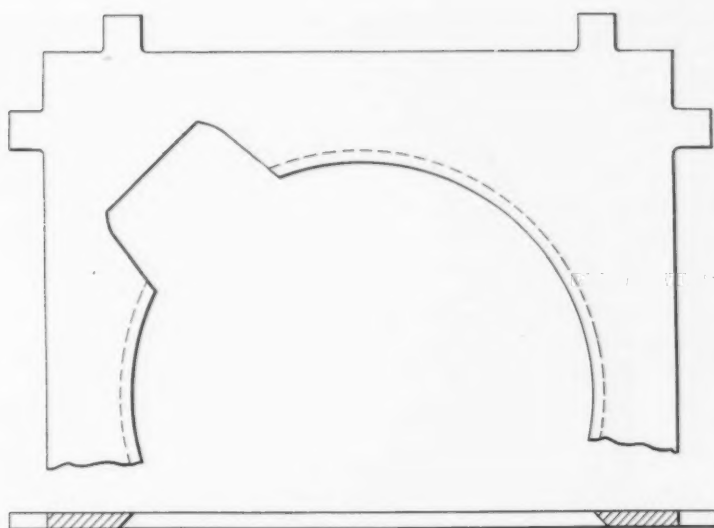
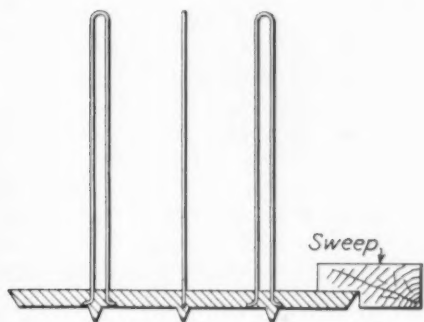
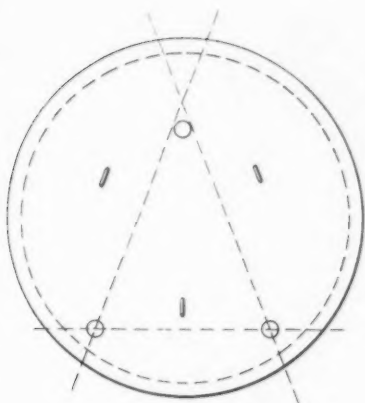
Fig. 1 illustrates a tire machine table 4 ft. in diameter, 3 ft. deep,

flanged inwardly at top and bottom, with four equidistant lightening holes in the side wall. Alternating with the holes, as shown in the sketch, four vertical stiffening members provide additional strength. Four castings, each weighing 940 lb., were required from a pattern which had given previous service and was constructed as simply and cheaply as possible, no provision for fillets being made. The prints intended to carry the lightener hole cores were screwed to place and the lower flange built up to a one-piece ring, connecting with the main pattern by a dowel pin at the base of each of the vertical members.

A three-part mold jointed at

MR. EASTHAM tells in this article how an apprentice completely outdistanced a journeyman in the production of four castings by the use of the improved facilities which are described

each extremity of the casting was therefore necessary to enable the molder to draw the flange pattern, set the hand hole cores, and apply the necessary finish to the vertical face of the mold and all the fillets. As indicated in the plan and sec-



ABOVE
FIG. 4—Outside lifting plate with open space in corner for gate.

AT LEFT
FIG. 3—Plan and section of interior lifting plate showing sweep and isometric attitude of guide feet.

To Cut Production Costs

By J. H. EASTHAM

and explained in this story. It is important to note that the use of the simplified equipment and method mentioned in the article turned a decided source of loss into a profit.

tional views of the assembled mold in Fig. 2, the "double rollover" system, as employed in greensand single sheave pulley molding practice, had served to turn out the castings formerly in another plant, the pattern being made with that sys-

tem in mind. Unfortunately, however, the extreme care required in molding the job by this system, and the 50 per cent scrap returns caused by scabbed and dropped molds, made the name of this particular casting an anathema to the foundryman who had hitherto enjoyed a monopoly of the costumer's business, so he included it in the list of items sent to the new competitor as a trial order. The estimate drawn up when the firm was approached included a 5 per cent allowance for defective castings from all causes, so in order to keep the unit on an independent paying basis no scrap whatever was permissible on an order for four, hence the need for a drastic change of

method which would combine safety with economy.

The beveled edge triple looped lifting plate shown in Fig. 3 was stamped level into a softened bed on the foundry floor. The area around its periphery was rammed to ordinary greensand mold hardness, and swept out to the thickness of the bottom flange of the casting. The flange pattern ring was then laid on the bed thus prepared, its upper face level with the upper face of the lifting plate.

One inch clearance between the feather edge of the inner plate and the edge of the lower flange of the pattern was allowed to facilitate contraction, as well as to provide a

little working joint space. The outer joint was carried out to a distance reasonably clear of the 60-in. square flask employed. As seen in the plan view of the inner plate in Fig. 3, three tapered guide feet cast on its lower side were set in a triangular position, the isosceles arrangement thus formed insuring the correct replacement of the center core when finally assembling the mold. The outer lifting plate, designed to carry the cheek section of the mold, was lowered

rammed up evenly to avoid possible distortion of the flimsily constructed pattern. Frequent layers of loose rods laid horizontally in the corners of the mold at the junction of the vertical ribs and the casting body further increased the mold's resistance to shock when hoisting and lowering the cheek. When ramming up the cope flask a wooden plug was placed over each of the three lifting loops cast in the center plate, the openings left by their withdrawal permitting the intro-

mounted by the cope, to which, through the above mentioned plug holes, the core was attached by three hook bolts secured by fish-plates to the cope bars. The entire assembly was then hoisted a couple of feet to allow the removal of the bottom ring, the cutting of the inlet gates and the slight finishing required by the lower parts of the mold. These operations were performed while the job was suspended (Fig. 5) for the few necessary moments before closing and weighting in readiness for pouring.

Perhaps the most interesting feature of the case is the fact that with these improved facilities an apprentice with less than three years' experience, under intelligent supervision, and with the added incentive of a small cash bonus, produced four high grade castings from four attempts. His actual time in each case was 5 hr. lower than that required by a highly paid journeyman who used the intricate double rollover method.

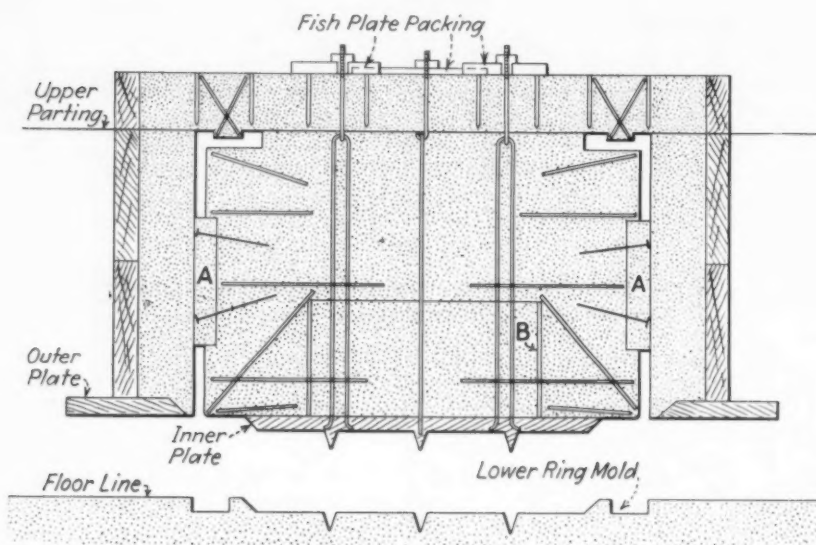


FIG. 5—Completed mold in suspension before closing. "A, A," hand-hole cores. "B," ring "leanto" supporting gagers.

on the outer joint in reverse position with the slope of its beveled edge facing upward. It was then tamped down to a neat touch all over its area, the cheek flask being set on the plate in readiness for filling and ramming.

With the exception of the area left open in the plate to accommodate the sprue and inlet spray gates (Fig. 4), no gagers or other reinforcements were necessary in the cheek portion of the mold. The overhang around the edge of the inner plate carrying that portion of the mold forming the upper face of the lower flange of the casting required a row of gagers placed closely heel to toe. Their upper ends were sloped inward and rested on the edge of an empty salamander firebox ring set on the plate beforehand.

From this point the actual molding was a matter of simple routine, the outside and inside being

duction of hook bolts at a later stage.

Upon completion of ramming the cope was removed and guide stakes driven to a suitable depth at each corner of the outer plate to guarantee accurate parting and re-assembly. After seeing that the necessary venting was under the upper flange and that swabbing and other preparations were attended to, the body pattern was drawn and the cheek mold hoisted off and set down out of the way. Cheek and body core now being easily accessible the fillets were cut and rounded, side handhole core-prints withdrawn, and the hand-hole cores set, each with $\frac{1}{8}$ -in. clearance allowed to form a fin so as to prevent a crush when closing the mold. A coat of plumbago facing was then applied both to core and matrix.

The cheek mold was carefully put back into place and sur-

Wins Packaging Competition

FIRST honors in the 1935-36 Irwin D. Wolf Awards Competition for distinctive merit in packaging was taken by the Five Star anti-freeze container entered and used by E. I. du Pont de Nemours & Co., Wilmington, Del., and designed by John Gilbert Craig. The award was made during the sixth packaging conference and exposition held by the American Management Association at the Pennsylvania Hotel, New York, March 3-6.

The exposition held concurrently with the conference featured packaging machinery in actual operation, as well as displays of packaging materials of all types. One session of the conference, with H. H. Leonard, vice-president, Consolidated Packaging Machinery Corp., presiding, was devoted entirely to the discussion of packaging machinery.

The 1935 consumption within the country of Swedish iron and steel increased over 1934 by 8 per cent to a total of 825,000 tons. In 1913 it was 390,000 tons. The manufacture of steel ingots rose to 895,000 tons, while other forms of iron and steel increased to 635,000 tons. At present most mills have good supplies of orders on hand.



FIG. 1—The modern bicycle is not only cheaper, but is made more accurately and gives better service.

Bicycle Manufacture Involves Many Manual Operations



GOING strong with no signs of slackening, the bicycle business is coming back. While it is true that the last few generations of children have ridden bicycles, today adults are returning to the "wheel".

When we think of the bicycle business our thoughts naturally revert to the craze of the Gay Nineties. During that period there were more than 50 American manufacturers; today there are seven. But the seven can turn out more "wheels" daily than the 50 ever dared dream of. Modern production methods are, of course, responsible for this.

The bicycle of today with its balloon tires and numerous acces-

By FRED B. JACOBS

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sories, including mud guards, electric lights and speedometer, is a vast improvement over grandfather's "safety"; furthermore it is also cheaper, is constructed more accurately, and gives better service.

But with all the improvements in manufacturing in the past 40 years numerous painstaking operations must still be done by hand, as illustrated and described in this article, which outlines several of the major manufacturing and as-

sembling practices at the plant of the Shelby Cycle Co., Shelby, Ohio.

Such parts as pedals, rims, tires, spokes, hubs, saddles, etc., are purchased ready made. Frames and handle-bars are made of high-grade seamless tubing, and the frame connections are steel stampings. Connections are blanked and drawn under special dies, while curved sections of the frame are bent or rolled to the desired contour in special tube forming machines.

Building Up the Frame

The first step in putting the bicycle together consists of building up the frame. Here a skilled workman takes the several frame



FIG. 2—In the first operation the frame is put together. With the head positioned in the wood block, all parts are pushed into place.

connections such as the head, seat post cluster, hanger cluster, rear fork clips, etc., and puts them together. This is all hand work as shown in Fig. 2, the frame in this instance being for a lady's bicycle. As the illustration shows, the head fits in a wood block fastened to the bench and in this position all the parts can be pushed in place. However, they must not be driven into position, as this sets up strains that are detrimental later. With the parts in place, the assembler inspects the frame carefully to see that it is in approximate alinement. The frame then is spot welded in various parts, as illustrated in Fig. 3, to maintain the alinement correctly.

From the welder the frames go to the brazing department, a partial view of which is shown in Fig. 4. This operation is called dip brazing, the entire joint to be brazed being immersed in spelter heated to a temperature of 1750 deg. As the term "spelter" often is used to designate zinc, it may be well to state that the material as used for brazing bicycle frames is a combination of copper and zinc, or brass. The flux used in this operation is borax. A correctly brazed joint is as strong as a solid piece. Care must be exercised, to make sure that the spelter flows through the entire joint; otherwise the joint would be faulty and might come apart when the bicycle was put to use. After brazing, the frames are pickled in an acid solution which removes scale.

Frame Machining Operations

A few machining operations, done in a battery of upright drills, are next in order. First the hole in the seat mast tube is reamed to size. Next the hole in the head is sized and its upper and lower surfaces faced to form an accurate

seat for the head bearing races. In this operation, the work is held in a special vise. Then the seat for the hanger bearings is reamed and faced, this being done on a third drilling machine. The slot in the back of the seat mast is then cut. This slot is necessary as the tube must contact when the seat post bolt is set up to hold it in place. This operation, done on a hand milling machine, fitted with special jaws to accommodate the work, is followed by tapping of the holes for the rear axle adjusting

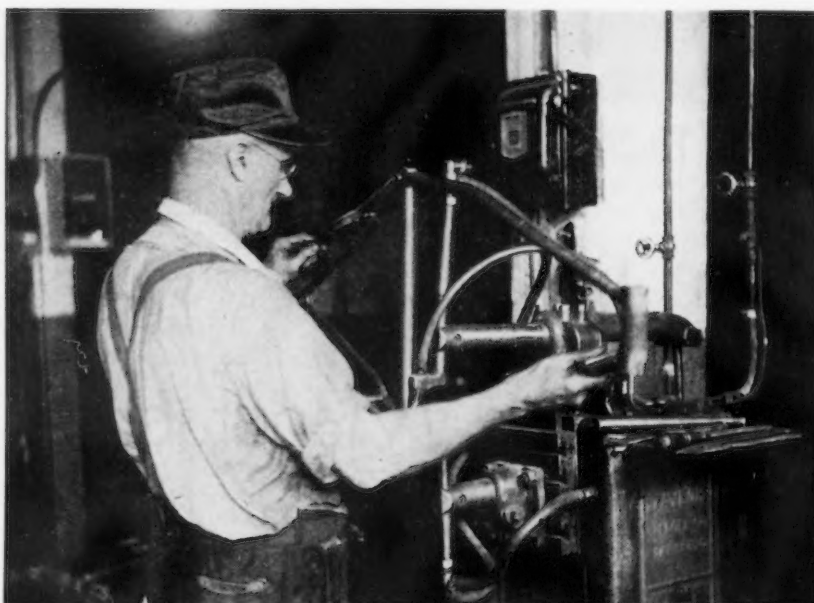


FIG. 3—With the members in place, various parts of the frame are spot welded.



FIG. 4—Dip brazing follows the welding. Joints to be brazed are immersed in spelter heated to 1750 deg. F.

screws on a machine located next to the hand miller.

Operations on Crank Axle and Cranks

The crank axle and cranks are made integral from an alloy steel drop forging. Machining operation on this unit consist of turning the seats for the bearing cones, cutting a right and a left-hand thread, and drilling and tapping holes for the pedal axles. The part is turned in a fixture, similar to that shown in Fig. 5, mounted on

FIG. 5—A double faceplate fixture of this type is employed in machining the crank.

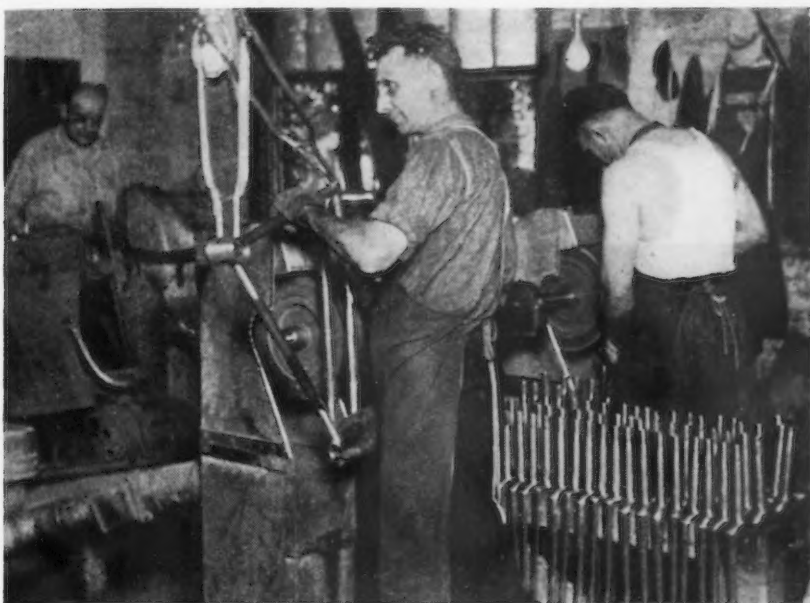
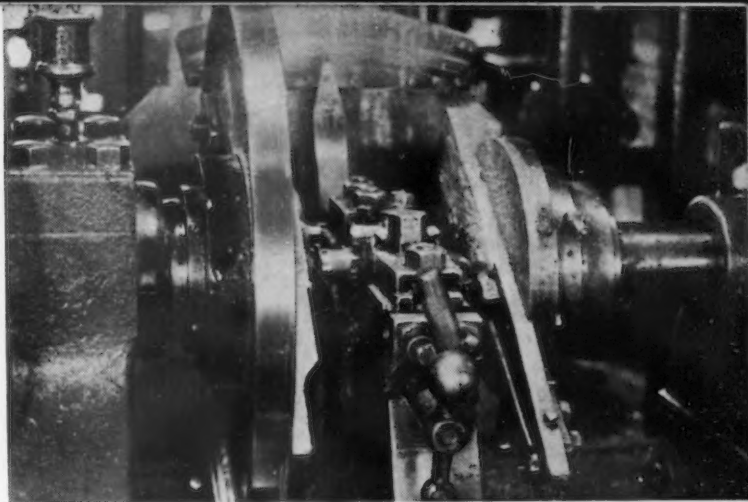


FIG. 6—Polishing operation on frames.

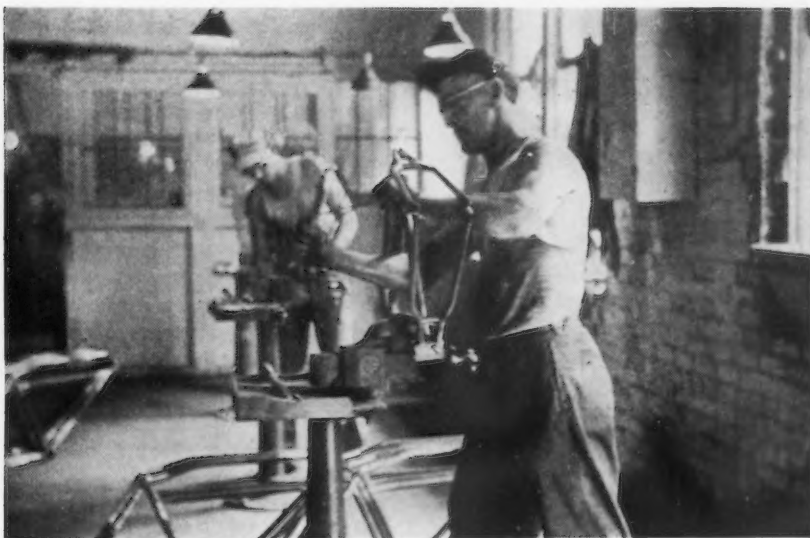


FIG. 7—Hand filing and polishing of frames.

an engine lathe. This is a double faceplate fixture, one faceplate being mounted on the spindle nose and the other on the tailstock. The crank is held securely on both faceplates, so that the crank and faceplates turn simultaneously. In this position the axle part is turned to size. Taking advantage of the cylindrical surfaces thus generated, the work is located on the fixture shown in Fig. 5, where the threads are chased with multiple-thread chasing tools. Holes for the pedal axles are drilled and tapped in a jig provided for the purpose.

Crank Polishing Operations

Next the unit is heat treated, after which the cranks must be highly polished. First the flash marks are ground away on solid grinding wheels, 14 in. in diameter, 2-in. face, 36 grit medium grade, operated at a surface speed of 5000 ft. per min. Then the parts are polished, using canvas wheels, 14 in. in diameter, 2-in. face being used. Each wheel is built up of several sections glued together under pressure to make a comparatively stiff unit. These wheels are headed up with abrasive in the ordinary way and are operated at a speed of 8000 surface ft. per min. The grits used in polishing are 60, 80, 120 and 150, manufactured alumina. The last operation is done on a Divine compress leather wheel to which grease is applied. The parts then are cleaned and subjected to a copper strike, followed by nickel plating, then copper plating, then nickel plating. The copper and nickel plating is color buffed on muslin wheels with rouge. Although the plating process is rather long and painstaking, it is productive of excellent results. All other nickel

plated parts are subjected to the same process.

Machining Front Forks

Several machining operations are necessary in making front forks, which are of round tubing. First a tube long enough to make two forks is swaged at each end to form the necessary taper. Then it is cut at the center in a turret lathe and the hole chamfered so that it will make a good fit against the fillet in the fork crown. The forks are then bent into elliptical shape between dies, while another set of dies is used to shape the necessary sweep at the front. Then the ends are flattened and drilled and reamed to fit the front axle. Finally, the forks are mounted on the crown, brazed and polished.



FIG. 8—In machine polishing the sides of front sprocket wheels, the work is held in magnetic chucks.



FIG. 9—Assembling of wheels.

In Fig. 6 is shown a polishing operation on frames. Here a canvas wheel with a grooved face is used and a skilled operator can polish over half of the tubing circumference in this manner. The material used is 60 grit, manufactured alumina. As it is impossible to get at all parts of the frame, hand filing and polishing is necessary as shown in Fig. 7. Here the operator grips the frame in a special vise and finishes the sur-

faces the polisher cannot reach. He uses a special cut, 10-in. bastard file and finishes the surfaces with strips of manufactured alumina cloth, 60 grit. This is all hand work that cannot be done satisfactorily in any other manner.

Sprocket Wheels Machine Polished

The only machine polishing, so-called, consists of polishing the sides of front sprocket wheels as

shown in Fig. 9. Here three sprockets are placed on a magnetic chuck which oscillates to pass the work back and forth under the wheel. These wheels are Divine compress set up to 80, 120, and 150 manufactured alumina. The last operation is done with grease. Following this, the parts are plated and polished as previously described in connection with the cranks.

As finish has everything to do with the sale of bicycles, careful painting also is necessary. After the frames are polished they are alined on a special fixture and then given a priming coat of synthetic enamel by the dipping process. Then the frames go into an oven where they are baked at a temperature of 350 deg. Thus protected, they will not rust and they can be stored away as stock to be taken out on order from the assembly department. Under ordinary conditions, bicycle frames are awkward units to store, but this has been overcome nicely by hanging them up on brackets attached to the ceiling. Thus they are out of the way, occupy space that could not otherwise be utilized and they can be taken out of stock at a moment's notice. Final painting is done just before assembly generally. The synthetic lacquer is



FIG. 10—Battery of wheel-truing jacks.

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sprayed in place and baked in special ovens.

Assembly Operations

As may be imagined, considerable manual labor is involved in putting a bicycle together inasmuch as a modern unit such as shown in Fig. 1 comprises about 1400 separate parts. By following a fixed system, however, the idle time in assembly has been reduced to a minimum. In Fig. 9 the operators are assembling wheels. They take a hub in which the spokes have been previously placed, put it on the bench and put a rim over it. Then they place the spokes in the proper holes. Of course, there is a little trick to this as there are four sets of spokes in a tangent wheel, two on each side, the two sets on one side crossing each other. However, the operators know just how many holes to skip in setting up each set of spokes and just how many spokes to "cross" in getting the correct tangent. After the spokes are in place the nipples are started on. Next another operator sets up the nipples with an air drill.

Truing wheels is a particular operation. Each spoke should be under the same tension, the wheel must run in a true circle, and the sides of the rim must be equi-

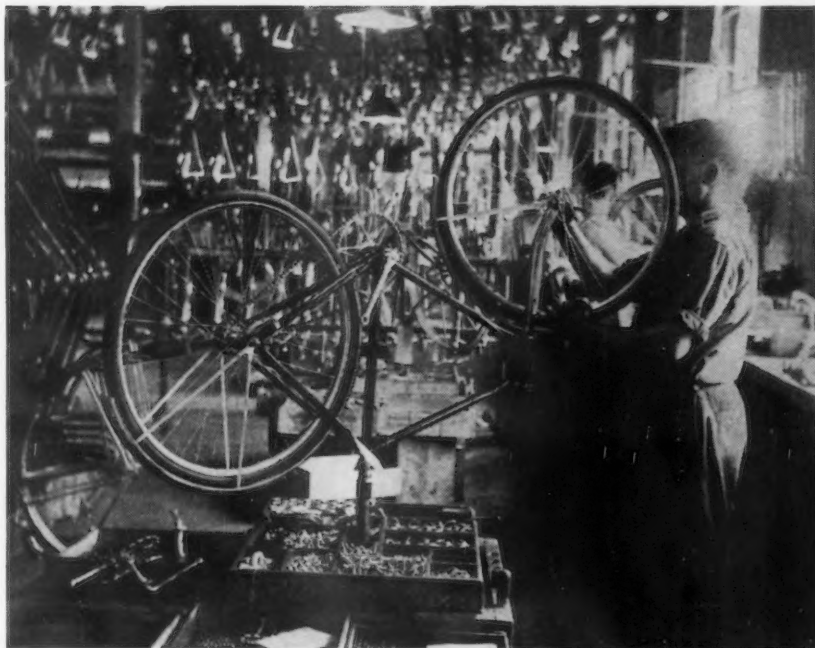


FIG. 11—Setting up wheels and putting on tires are sub-assembly operations.

distant from the ends of the hubs. A battery of wheel truing jacks is shown in Fig. 10. It is all hand labor, but each assembler is supplied with gages to facilitate his work. After the wheels are trued correctly, the tires are put in place and inflated to a pressure of 20 lb. per sq. in.—another manual operation. The balloon tires previously mentioned are 26 in. in diameter by $2\frac{1}{8}$ and $2\frac{1}{4}$ in.

Setting up wheels and putting

on tires represent sub-assembly operations. Final assembly is shown in Fig. 11. Here the operator puts the frame over a post provided for the purpose so that the frame is free to revolve in a complete circle. As the illustration shows, compartments for various screws, nuts and other parts are provided so that everything the assembler uses is within easy reach. He builds up the frame from the start, putting in the crankshaft and bearings, setting the front fork and wheels in place, adjusting all bearings, putting on the mud guards, etc. A skilled man will assemble an entire bicycle while a layman would still be thinking what to put on next. Through long practice the assemblers have learned to eliminate all unnecessary motions.

In the final test the operator sets the machine on a jack and sees that the bearings are adjusted correctly, that the mud guards are in place properly, looks for minor defects in finish, etc. If given his O.K., the completed bicycle goes to the shipping department to be crated, pedals, saddle and handle bars being securely fastened in a separate compartment in the crate.

Coloring of Metals

(1) Steel and Iron

By HERBERT R. SIMONDS and
C. B. YOUNG



ASSUMING that color is an advantage in our present industrial life, it then becomes immediately apparent that steel and many other metals are at a disadvantage in that they are usually associated in the popular mind with an absence of color, whereas plastics, which have developed industrially only during recent years, have somehow achieved a color association. We think of steel as dull. We think of plastics as bright. This is perhaps a more serious situation than most metal producers and metal fabricators care to admit or even realize.

Of course metal may be painted or enameled and it is to the bright

colors thus produced that thousands of metal parts owe their popularity. But for parts such as gages, building hardware and safety razor handles, a color more intimately associated with the metal may be desired. Thus it is desirable to color the metal itself. Many metallurgists today feel that within reasonable limits any metal could be given any color if the demand for such result were great enough. Recently a fabricator asked how to give a certain alloy a bright blue color. He was told that such a development was highly possible, but that it would cost about \$2,500 to investigate. Of course research of this character should be conducted by a group rather than an individual, as the individual's needs seldom warrant the expense of the investigation, and protection by patent is often difficult. The whole question of color treatment of metals might well be investigated by a foundation or a technical school, or perhaps by a research association sponsored by the metal-working industry.

Four different methods of coloring iron and steel are discussed in

the following paragraphs. These methods are (1) heat-treating, (2) chemical treatment of surfaces, (3) alloying, and (4) plating. Each of these produces a color with metallic characteristics clear through to the surface as distinguished from painted or enameled products where the metal ends some distance from the surface.

Usual methods of producing a corrosion-resistant surface on steel have not been included here, as their chief function is clearly out of the field of coloring, and in most cases subsequent organic coatings are planned. In the case of parkerizing, for instance, a distinctive color is actually produced, but the surface created is seldom used as a finish or top surface. One modification of the parkerizing process might be mentioned as it has but recently been introduced. This consists of tumbling freshly parkerized parts in a barrel containing very finely powdered aluminum. Through this means the aluminum particles infiltrate to an appreciable depth in the porous coating and the result is a surface with an appearance similar to that

of cadmium plate and corrosion-resistant properties which are said to compare favorably with cadmium plate.

Heat Treating

Probably the oldest method of coloring metal is that of heat treating. In early metallurgy, steel was tempered to the desired hardness by carefully watching its color at the time of quenching. This is still the method used in many small plants, particularly in those devoted to the production of axes and cutlery. As steel is heated through a gradual range of temperature, each fraction of a degree for a given specimen of steel produces a definite shade varying from a straw yellow, through brown and purple to dark blue. Nearly all of these different shades may be set or fixed by properly controlled treatment.

The difficulty in getting color by this means is largely one of accurately securing the desired temperature. One of the best methods is to heat the specimen in a liquid or molten bath. It is possible to uniformly maintain a molten alloy bath at almost any desired temperature. Also, it is possible to find salts which will stay molten and passive at most temperatures desired for coloring.

Modifications of simple heat treatment are employed to produce different colors and color effects. In general, heat treatment without added chemical process gives a dull color which, in many cases, changes under subsequent oxidation. Because heat treating and chemical processes are usually combined in producing color effects, it is impossible to draw any sharp line between them. The processes where heat treatment predominates will be considered first, however. Highly tempered steel blades may be colored by heating to between 550 to 600 deg. F., which is low enough to avoid influencing the temper. For good results it is necessary in this process to have a very clean surface, and light polishing usually takes place after the coloring as well as before it.

A gunmetal blue may be obtained on steel by heating from 600 to 650 deg. F. in a nitre bath. This bath is made up of equal parts of sodium and potassium nitrate with manganese dioxide added in a ratio of one part oxide to 50 parts nitre. The bath must be kept strictly clean and this is one of the diffi-

THIS is the first of a series of four articles intended to cover the principal commercial developments in a field which seems destined to become more and more important. One of the alluring goals of research work in this field is the dyeing of molten metal. Research work toward this end is under way, but results as yet are too incomplete to report. Nevertheless, some investigators feel that there are great possibilities in this direction. We may, for instance, expect some day to have a homogeneous blue iron casting which will remain the same shade after machining. Commercial coloring of metal at present is limited to surface treatment and to alloying, and this and the following three articles are confined to such treatments as distinguished from coloring through the application of organic coatings.

In re-designing of metal products, it is generally agreed that the new design must function as well as the old, and in a large majority of cases good re-designing means improved functioning. In coloring steel the same principles should prevail; that is the colored surface should have qualities fully equal to those of the uncolored surface. In actual practice most coloring processes improve surface qualities, thus the new surface is either more corrosion-resistant or more abrasion-resistant than the original surface. This is not always true, as some chemical treatments tend to soften the surface layer.

As against organic coating, chemical treatment usually does not alter dimensional accuracy. The depth of penetration of the treatment varies with the different processes, but an average depth of about 0.0002 in. results from most of the methods described herein.

In this article, the first of the series of four, the following methods of producing various colors in iron and steel are described:

Color	Heat Treatment	Chemical Treatment	Alloying	Plating
Black	2	6		1
Blue	2	9		
Dark Blue	3			
Very Dark Blue	1			
Brown	2	1		
Yellow	3	1		1
Purple	1			
Bronze		1		
White		1	1	1
Green Gold				1
Rose Gold				1

Three more articles on coloring will follow in THE IRON AGE over the next two months. These subsequent articles will deal with the coloring of (1) copper and brass; (2) aluminum, cadmium, chromium, nickel and tin, and (3) zinc and zinc-base die castings.

Mr. Simonds is vice-president of Metal Products Exhibits, Inc., at Rockefeller Center, New York. Doctor Young, associated with Dr. Colin G. Fink at Columbia University as an instructor in chemical engineering, is also technical director of the United States Research Corp., Long Island City, New York.

culties in the way of practical operation. Where the process is used commercially the articles to be colored are carefully cleaned and then given a thin coat of oil before they are immersed in the bath. The work is left in the bath until the parts reach the desired color. Then it is quickly removed and rinsed first in cold, then in hot water (usually at boiling temperature), and finally in hot oil. If a darker blue, known in the trade as a dark

gunmetal blue, is desired, the temperature of the bath is held at 1000 deg. F.

If the desired color is darker than can be secured through the nitre bath method, steel parts may be heated in a retort containing a small amount of charred bone. The temperature in this case should range between 700 and 800 deg. F. After the parts are oxidized the temperature is dropped to 650 deg. F. and a mixture of bone and "car-

bonia oil" is added. The result is an almost black gunmetal finish which is very durable. One of the difficulties with this bath is the element of time, as several hours are required in the process. On removing the parts from the retort the articles are rolled in oily, granulated cork until a uniform finish is secured.

When steel is heated in free air, pale yellow is obtained at about 418 deg. F., straw at 440 deg. F., brown at 491 deg. F., purple at 536 deg. F., pale blue at 572 deg. F., and dark blue at 599 deg. F. Colors obtained in this way are fugitive, as previously explained, unless the process is accompanied by further treatment. Also, in addition to the temperature in simple heat treatment, the color depends to some extent on the nature of the steel and to a greater extent on the duration of the heat.

Black Colors

A black finish may be obtained on a chromium plated article with a fairly simple heat and chemical process and, as this is one method of securing a bright black finish on steel, it will be mentioned here as

well as in a subsequent article describing methods of coloring chromium. A molten bath of sodium cyanide 45 per cent, sodium bicarbonate 35 per cent, and sodium chloride 20 per cent, is prepared. The chromium plated parts are then submerged in this bath and held just above the fusion point for 2 to 3 min. After removal they are washed and the result is a pleasing glossy black finish which is fairly stable under ordinary conditions.

A black color on chromium plate may also be secured through the use of chromic acid with the addition of certain organic acids such as propionic and acetic.

A black color on iron and steel is frequently produced with a solution containing 400 gm. of sodium hydroxide, 600 gm. of water, 10 gm. of potassium nitrate and 10 gm. of sodium nitrate, which is held at a temperature between 248 deg. and 266 deg. F. This process requires 20 or 30 min. immersion in the bath, with subsequent washing.

The question often asked is how to color castings in a method to withstand subsequent high temperature such as required for coal ranges. Adolph Bregman has given

the following answer to this problem: "The surfaces of the castings are polished and thoroughly degreased, then the castings are immersed in the following solution composed of copper sulphate, 8 parts by weight; nitric acid, 15 parts by weight; and alcohol (ethyl), 30 parts by weight. The parts after removal from this bath are allowed to dry in the air and when quite dry are rubbed with woolen cloths. A thin film of oil is applied for final protection."

Brown colors are more difficult to obtain than blue, but a good and practical method of obtaining a dull brown is to first pickle the parts in acetic acid and then immerse them in a water solution of sodium hydroxide and heat to 150 to 200 deg. F. Additions such as litharge, urea and ammonium nitrate give variable shades but are difficult to regulate.

Chemical Coloring

Many methods of coloring iron and steel by chemical treatment alone are successfully employed today. Some of these have disadvantages either in the technique of production or in the lasting qualities of the finish itself. Of the following methods here listed, some are being used in commercial operations, others have been produced experimentally and many have been tested in the laboratories of the U. S. Research Corp.

A black color on iron is produced by a sodium hydroxide bath at 300 to 320 deg. F., which will not affect the hardness of the material. The baths for this method have the disadvantage of slowly uniting with carbon dioxide of the air, forming sodium carbonate, if they are left exposed when not in use.

The following direction for producing a blue color on steel is in use by a commercial company. Clean the material with an alkaline cleaner and immerse in a solution containing ferric chloride, 2 oz.; mercuric nitrate, 2 oz.; hydrochloric acid, 2 oz.; alcohol, 8 oz.; water, 8 oz. Leave the work in this solution for 20 min. Remove and allow to dry for about 12 hr. Repeat the immersing and the drying operation. Then place the work in boiling water for 1 hr. and dry again. Finally, lightly scratch brush and oil the surface.

Various shades of blue on steel can be produced in a solution of sodium hyposulfite, 8 oz. per gal.;



METAL handles for a variety of uses are frequently colored by chemical means so that they will harmonize with surroundings and at the same time retain the effect of a metallic finish. Photo by courtesy of the New Jersey Zinc Co.



In a room such as this, metal competes with plastics and other non-metallic materials. As soon as the metal parts can easily be given bright colors, their competitive position will be much strengthened.

lead acetate, 2 oz. per gal. This solution is used at 212 deg. F.

Blue on cast iron has been experimentally produced in a bath of lead nitrate, 1 oz. per gal.; ferric nitrate, 0.5 oz. per gal.; sodium hyposulfite, 4 oz. per gal.

Another company gives formulas for coloring steel by application of solutions with a sponge. After being coated, the parts are allowed to dry for several hours and the rust which forms is scraped off, leaving a thin, tightly adhering coat of oxide of the desired shade. Usually the surface is oiled afterward for protection. The different solutions are as follow:

For Producing Black

	Parts by Weight
Bismuth chloride	20
Mercuric chloride	40
Copper chloride	20
Hydrochloric acid	120
Alcohol	100
Water	1000

For Producing Brown

	Parts by Weight
Alcohol	45
Iron chloride	45
Mercuric chloride	45
Sweet spirits of niter (ethyl nitrate plus alcohol)....	45
Copper sulphate	30
Nitric acid	22
Water	1000

For Producing Blue

	Parts by Weight
Iron chloride	400
Antimony chloride	400
Gallie acid	200
Water	1000

For Producing Bronze

	Parts by Weight
Manganese nitrate solution....	700
Alcohol (10 per cent).....	300

Many methods are used to produce blue on steel but the choice is dependent on such divergent factors in each individual case that no best process can be listed. The following five methods of producing

this color have been found satisfactory under a variety of conditions:

(1) Immerse parts for 5 min. in a molten solution of potassium permanganate, 1 part; sodium nitrate, 2 parts; potassium nitrate, 2 parts; hold just above the fusion point.

(2) Clean parts thoroughly; immerse in boiling water for 5 min., then in a solution of mercuric chloride, 8 oz. per gal.; potassium chlorate, 8 oz. per gal.; potassium nitrate, 8 oz. per gal., to which 12 oz. of spirits of niter are added while the solution is held at 100 deg. F. Raise the temperature of the solution to 110 deg. F. for the coloring operation. Parts are held in the solution for 5 min., are then cleaned and polished, and the process is repeated several times to give a richer and greater depth of color.

(3) Parts are cleaned and then immersed in a solution of white arsenic, 16 oz.; muriatic acid, 1 gal.; water, ½ gal.; parts are immersed until a light blue color is secured.

(4) Make up a bath of caustic soda, 5 oz. per gal.; white arsenic, 5 oz. per gal.; sodium cyanide, 1 oz. per gal.; the bath is prepared as follows: Dissolve the caustic soda in arsenic and hot water, then cool and add

sodium cyanide. This solution is then introduced into a plating or similar tank, equipped with electrodes, and a current density of 2 amp. per sq. ft. is passed through, using steel, bronze or carbon anodes. The steel parts to be colored are used as the cathodes and are immersed in this solution for 1 to 3 min.

(5) Immerse parts in a bath composed of mercuric chloride, 4 parts; potassium chlorate, 3 parts; alcohol, 8 parts; water, 85 parts; and allow the parts to remain until the desired shade is secured.

Trends in Color

One of the first colors associated with iron and steel products was black. Usually this was an organic coating such as that used for the first automobiles. Later, when color coatings and bright metal finishes became popular, the demand for black in any form dropped to a low point. Now, however, there is a swing back toward a black metal finish and much interest is noted in methods of securing this color by chemical means. Some of the best processes are covered by patents, and a license must be secured before they can be used. Some processes, however, are quite generally known and used with varying degrees of success. Two of these are as follows:

(1) Dip well-cleaned steel into a solution composed of copper sulphate, 80 parts; alcohol, 40 parts; ferric chloride, 30 parts; nitric acid, 20 parts; ether, 20 parts; water, 400 to 500 parts.

(2) Same as (1), except use a solution containing sulphur dissolved in turpentine; then hold in a non-oxidizing flame until dry. Repeat this until an even black is obtained; and rub with oil.

Many other formulas are used for coloring steel and some proprietary ones have distinctive properties. However, it is thought that the above fairly well covers the present practical color range to be produced by chemical and heat processes.

It will be noted that most of the colors are either dark blue, brown or black. Here then is an opportunity for further research. Do we not have a right to ask, "Why can't we produce directly on steel, yellow, orange and red?" This should be a comparatively easy undertaking as the many chemical compounds of iron vary in color from red through yellow to brown. For instance, ferric oxide (Fe_2O_3) is a good example of an attractive red. But, the color of this oxide to date has not been satisfactorily applied to steel by chemical means, although

the oxide forms an important pigment in paints. The basic ferric carbonate produces a bright yellow color but here again it is mechanically unstable as a surface treatment.

Alloying of steel for color effect is limited almost entirely to the

and non-soluble in most plating solutions and by the use of intermediate deposits, any surface coat desired may be produced. Thus chromium, which is difficult to deposit on steel direct, may easily be placed on nickel which in turn deposits readily on steel.



PRESENT commercial practice makes it possible to give the familiar teapot a variety of colors and still have it retain its metallic characteristics. Photo by courtesy of Pyrene Mfg. Co.

stainless steel group. The chief reason that chromium-nickel steels have been used as decorative features in building construction is that they produce a desired color contrast. Incidentally, the material has many unique properties other than color and where used principally as a color note, the expense is high. To correct this, some manufacturers have turned to plain nickel steels and others to low chromium steels. One steel with about 12 per cent chromium is being used to produce a desired color in decoration.

In the non-ferrous field alloying for color is one of the commonest practices.

Plating for Color

While the plating of iron and steel is usually for appearance, it is not often considered a coloring process. However, a wide range of colors may be produced by the electrodeposition of various metals and alloys.

Steel is relatively easy to plate as the metal is comparatively inert

The usual plating processes have been described so often that no attempt will be made to cover them here. Unique colors on steel can be secured by plating some of the less common alloys and this technique seems to belong quite logically under the heading of coloring. For instance, the nickel cobalt alloy produces one of the whitest metal surfaces known. This is due to the fact that nickel has a slight yellow cast while cobalt produces a blue cast. When these two are united the result is close to a pure silvery white. It is possible to deposit this alloy from an acid sulphate solution and the following technique has been found satisfactory.

The bath is prepared with a ratio of ten nickel to one cobalt, both metals being in the form of sulphates. About 2 oz. per gal. of boric acid is added to maintain a constant pH. Either nickel-cobalt or insoluble anodes can be used. The bath is electrolyzed at 80 deg. F., using 10 to 30 amp. per sq. ft. By varying the current density, temperature, pH of solution, and ratio of nickel ion to cobalt ion,

different alloys of these two metals can be obtained with their corresponding different shades.

Brass plating on steel is, of course, a common practice. Yet many manufacturers who regularly use this process are not aware of the variety of colors which can be

Yellow Gold

Metallic gold as fulminate or cyanide.....5 dwt. per gal.
Potassium cyanide2 oz. per gal.
Sodium phosphate5 oz. per gal.

Use the above solution with gold anodes at 140 to 180 deg. F. with a current density of 1 to 10 amp. per sq. ft.

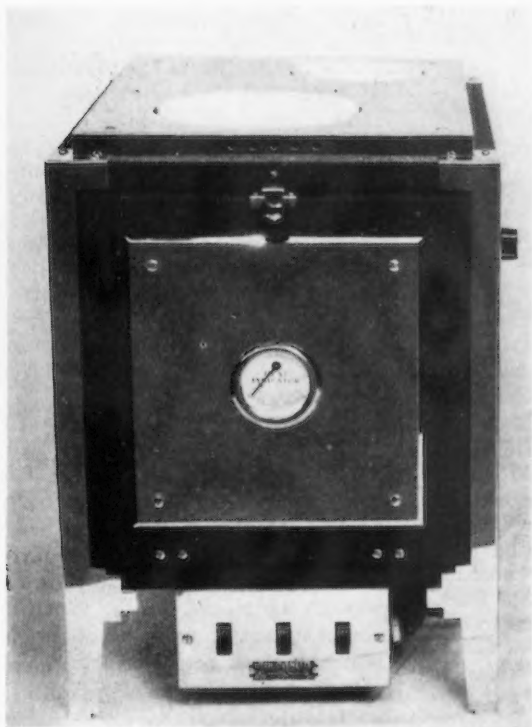
amp. per sq. ft. A small amount of copper cyanide or carbonate added to this solution produces a red color.

White Gold

Gold sodium cyanide.. 5 oz. per gal.
Sodium cyanide2.0 oz. per gal.
Potassium hydroxide .033 oz. per gal.
Silver cyanide0.66 oz. per gal.
Nickel cyanide0.125 oz. per gal.

Use the above solution with 18 carat gold anodes at 80 deg. F. with a current density of 10 to 20 amp. per sq. ft.

A fairly well standardized black nickel plating solution is the following: Nickel ammonium sulphate, 8 oz. per gal.; zinc sulphate,



o o o

AT LEFT

METALLIC surfaces of modern stoves are frequently used in contrast with colorful backgrounds. It would be possible to have the metal itself appear in pleasing contrasting colors.

o o o

AT RIGHT

THE metal surfaces of flexible fasteners such as this must withstand continuous abrasion for years. This calls for unusual surface features difficult to obtain in color, yet here colors to match fabrics are often very desirable. Photo by courtesy of the New Jersey Zinc Co.

o o o

Green Gold

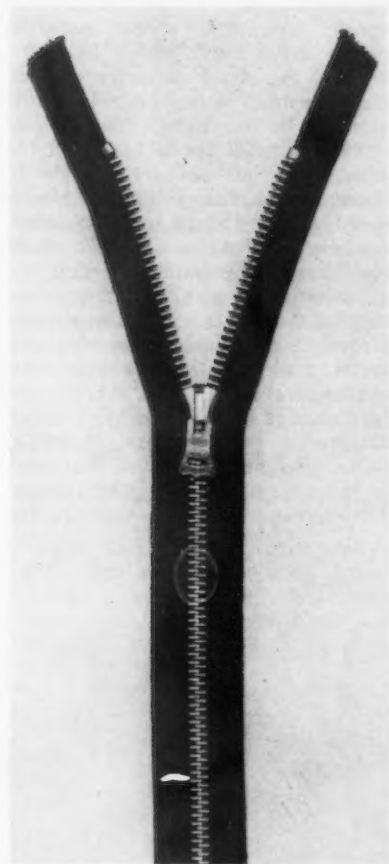
Metallic gold as chloride 5 dwt. per gal.
Metallic silver as chloride0.25 dwt. per gal.
Sodium cyanide 4 oz. per gal.

Use this solution with platinum or gold-silver alloy anodes at 140 to 180 deg. F. and at a current density of 1 to 10 amp. per sq. ft.

Rose Gold

Potassium ferrocyanide...4 oz. per gal.
Potassium carbonate....4 oz. per gal.
Sodium cyanide...0.25 to 0.5 oz. per gal.
Metallic gold as fulminate or cyanide....10 dwt. per gal.

Use the above solution at 175 deg. F. with platinum anodes at 1 to 10



secured by simply varying one or more variables, such as increasing the current density, agitating the solution, changing the ratio of copper to zinc in the bath, changing the temperature of the solution, and increasing or decreasing the free cyanide content.

Contrary to modern beliefs, many steel articles are plated with gold for every-day use. It is surprising how small an amount of gold is needed to give steel the beautiful yellow color of pure gold. The coating used is frequently but a few molecules thick. It is common practice to give the steel a flash of copper or brass before coating with the gold.

A variety of plated colors can be obtained with gold as a base, if various metals are added to the gold plating bath, such as silver, nickel and copper. Four typical gold colors are produced with the following plating solutions:

2 oz. per gal.; sodium sulphur cyanide, 2 oz. per gal.

This solution is used at 80 deg. F. with a pH of 5.3 to 6. Carbon or nickel anodes are used with 2 amp. per sq. ft., producing 1 to 1.5 volts. By varying the constituents of the above formula, a very neat gray nickel alloy plate can be obtained upon steel. Some startling effects can be secured with other alloys, but unfortunately most of those investigated are subject to fairly rapid tarnishing.



Improvements in Production

Increased Capacity for Small Motor Driven Screw Machines

BBROWN & SHARPE MFG. CO., Providence, R. I., has incorporated a number of design and structural changes in its No. 00G, high-speed, automatic screw machine, motor drive only, which have increased the chuck capacity of that machine up to $\frac{3}{8}$ in. in regular work and $\frac{1}{2}$ in. on light, free-cutting work. Spindle speed has been increased by 20 per cent, with 36 changes available ranging from a new low of 200 r.p.m. to a new maximum of 6000 r.p.m. Within these ranges may be found the full requirements for either hard or free-cutting materials. To assist the operator in feed and speed changes, metal plates with diagrams and charts of spindle speed change and feed change mechanisms, as well as obtainable gear change combinations, are now mounted adjacent to the respective mechanisms. Through increased spindle capacity

for regular work, former borderline jobs are now properly assigned to this machine. Stops in driving shaft clutches have been superseded by stop-plungers in the turret indexing and in the chuck and feed mechanisms. Improvement in the

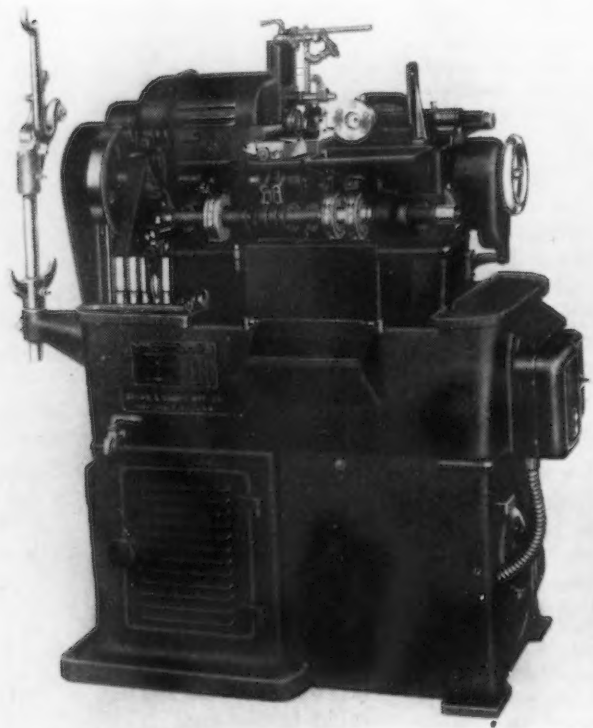
gage-stop mechanism provides for more positive operation. Changes in the front spindle bearing cap and in the bed facilitate the installation of a vertical slide attachment.

The improved machine is available in simplified form for work not requiring the tooling of a full automatic; the turret forming machine, which does not provide reversal of the spindle, and cutting-off machine, which provides neither reversal of spindle nor indexing turret features.

Convenient Retainer for Toolroom Wrenches

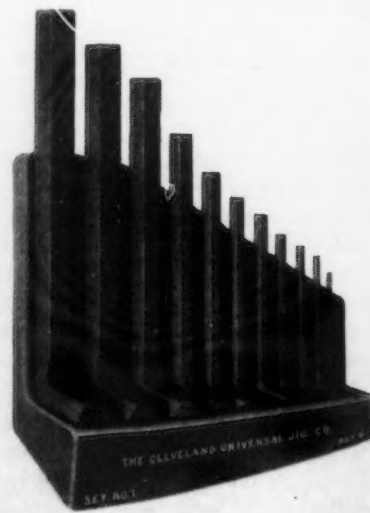
COMPOSITION rubber is used in molding bases for holding special socket wrenches in upright, and instantly available, position for toolroom and assembly work. The equipment is announced by the Cleveland Universal Jig Co., Cleveland. The No. 1 set illustrated is fitted for each of 11 sizes ranging from $\frac{3}{32}$ to $\frac{1}{2}$ in. across the flats, and is especially convenient for as-

sembly benches. The second set is fitted for eight sizes with the same range and is particularly convenient for toolroom work. When a wrench is placed in its separate compartment it rests at an angle which insures retention in an upright position with all wrenches sufficiently separated to permit quick selection of any desired size.



AT LEFT

MAXIMUM range of screw machine spindle speeds has been increased by 20 per cent, 200 to 6000 r.p.m., in providing that work heretofore requiring two sizes of machines may be done on this single machine.



REDUCTION of lost time through quick availability of the right socket wrench features this toolroom wrench holder.



Simplified Oilgear Variable-Speed Transmission Has Greater Capacity

FLUID power variable-speed transmissions built by the Oilgear Co., Milwaukee, have been markedly simplified and improved by a redesign of input and output units. The simplification is due largely to the development of a new mushroom-type rolling piston, which makes obsolete the 14 parts formerly required to accomplish the same motions. The redesign makes possible increased capacities with sharp reductions in size and cost. Also friction and resistance-load on each piston is lessened, and the durability of this type of transmission is appreciably increased.

The illustration shows the arrangement of the new transmission, which, as before, consists of a variable-delivery pump unit, a constant-displacement motor and a suitable control mechanism, all enclosed in a compact case. The lubricating oil used as the power fluid flows from unit to unit through drilled and cored passages incorporated for the purpose, and protection against overload is provided by integral relief valves in the fluid passages. An outstanding charac-

teristic of this form of fluid power transmission is that within its working range, it produces stepless volumetric speed control irrespective of loads.

Operation and advantages of the new rolling piston, which is the main element of the redesign, are described as follows: The convex surface on top of the piston is accurately ground and lapped to work with the conical surface of a hardened and ground reaction ring. Piston reactions are transmitted from a single spot on the convex surface of the head to the concave surface in the reaction ring. As this contact spot is offset from the axis of the piston, and the rotor unit is eccentric as regards the cylinder block, the piston reciprocates and rolls simultaneously, both these motions being uniformly accelerated and decelerated. The action imparted is similar to that used in lapping a small cylinder, the extent of each motion being governed by the stroke of the pump.

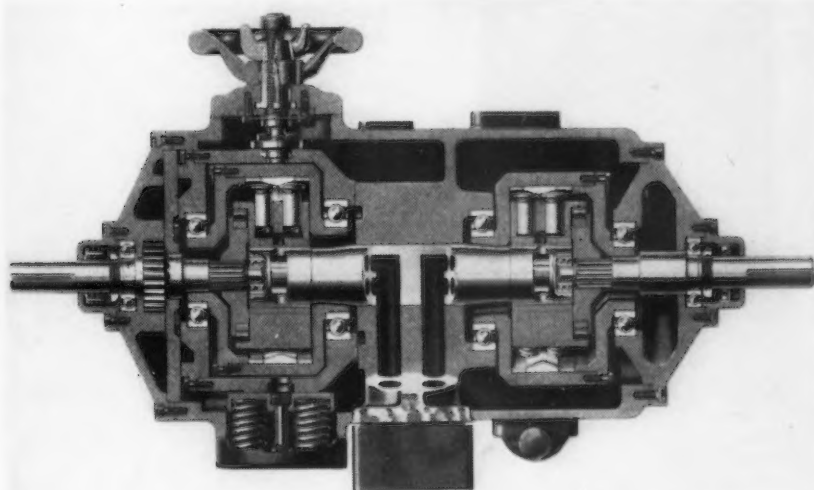
As the new rolling pistons are smaller and lighter, more of them can be placed in the cylindrical

area occupied by the former cross-head-type pistons; and additional rows can be arranged compactly in the longitudinal section of the cylinder, thereby reducing the pumping force on each piston. The smaller, lighter and greater number of pistons, the lower piston reactions, and the accelerated and decelerated rolling action of the piston are emphasized as resulting in a new standard of high speed, with quieter and smoother operation. The output end of the transmission is said to exert a torque efficiency of 88 per cent when starting and 97.6 per cent at 120 r.p.m.

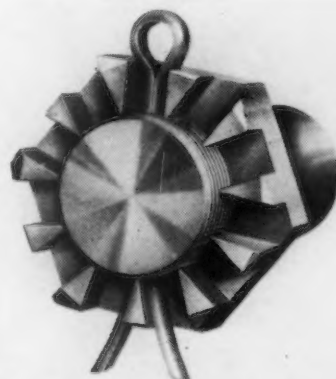
This new Oilgear transmission is available in a variety of sizes, from 2 to 100 hp., and with several different types of hand, automatic and remote control. Output speeds are steplessly variable in either direction throughout the speed range of 5 to 1090 r.p.m.

Cooke Slotted Nut Has Closer Adjustments

PRODUCTION has been started on an improved Cooke micro-slotted nut by the Blatchford Corp., 80 East Jackson Boulevard, Chicago. The nut offers 10 to 22



PLAN view of new Oilgear fluid power variable-speed transmission. Use of rolling pistons reduces the number of parts and makes possible greater compactness and increased capacity.



TIGHT locking of a self-spreading special cotter pin is incorporated in the improved nut design illustrated.

adjustments per turn. The keying edges are located off center from one another, making two keying positions available for each slot. The key can be inserted from either end of a bolt hole thus always find-

ing a spreading wedge. The accuracy of position obtained is from 0.008 to 0.013 in., depending upon threaded shank size. The key is set by simply tapping and is spread outwardly by the wedge, filling the

space between the wedge point and the side of a hole. A key accompanies each nut and is properly trimmed to an internal V-shape so that it spreads around the wedge without tendency to catch.

New Column-Type Sliding Head Drilling Machine

FRICCTIONS and clutches are not used for controlling the starting, stopping and reversing of the spindle in a new sliding head drilling machine built by the Cleerman Machine Tool Co., Green Bay, Wis. A standard ball-bearing reversing motor, 1200 to 1800 r.p.m. of low-starting current and high-torque type is used in conjunction with built-in push button controls for forward, reversing and stopping. The driving motor is direct connected and is located directly in back of the main head or housing.

The line is built in round column type and in sizes 21, 25 and 30 in. A range of nine feeds from 0.005 to 0.045 in. is provided. There are 12 spindle speeds which can be made in two ranges—50 to 1000 and 75 to 1500 r.p.m. The speed and feed box, both built on the unit principle, houses all of the speed and feed gears and the shifting

mechanism; mounting is ball bearing throughout. The equipment can be supplied with two to six "ganged" spindles. Speed-box shafts are all in horizontal position. Sliding gears and shafts in both boxes are six-splined. Spiral bevel gears drive the spindle. The spindle unit is ball bearing for both radial and thrust loads. Spindle-nose bearings are preloaded. The spindle and sleeve are six-splined and have a tang slot located in a hardened insert. Provision is made for automatic depth gage up to the full travel.

Channel Valves for I-R Compressors

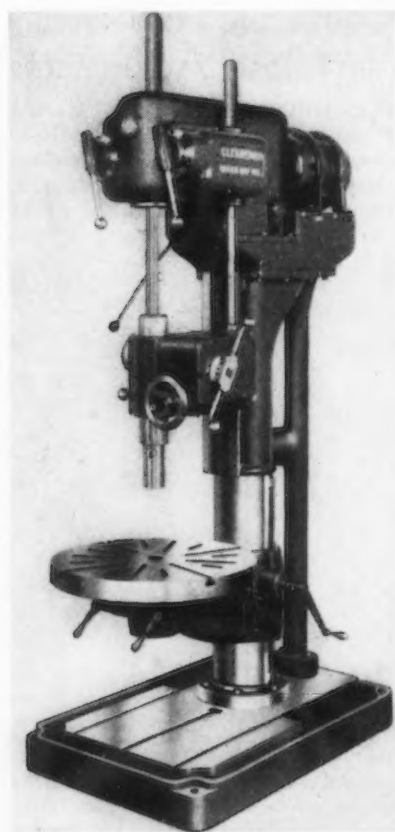
ANEW development in compressor valve design is the channel valve here pictured, announced recently by the Ingersoll-

Rand Co., 11 Broadway, New York. Higher efficiency is attributed to greater effective lift area than any other plate valve used by the company. Silent operation, due to elimination of valve impact, is also a feature; and the absence of impact and elimination of valve flexing is emphasized as making for longer life and lower maintenance.

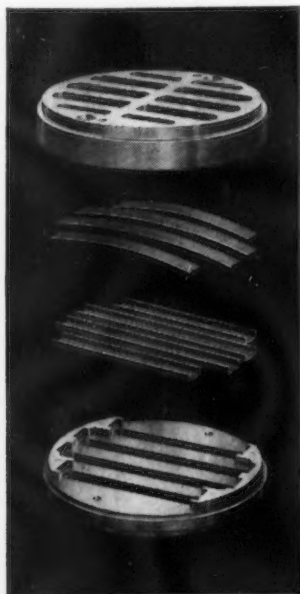
The new valve comprises a stop plate, several stainless-steel channel sections, an equal number of stainless-steel springs, and the channel valve seat. The valve channels and springs are the only moving parts. The springs fit snugly within the channels so that when the valve channels lift, the springs straighten and a small quantity of air is trapped between the springs and channels. The air cushions thus formed are said to decelerate the valve channels after opening and bring them to a stop quietly and without impact. Valve channels consequently can be made light in weight, their channel form being relied upon for strength and rigidity. They lift straight off the seat without flexing, returning to the same position. Springs can also be designed solely as springs because they are not required to act as valves.

Improved Forged Steel Globe Valves

AN improved line of forged steel globe valves, by the Hancock Valve Division of Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn., is made for pressure ratings up to 1500 lb. and is designed with a tongue and groove bolted bonnet for high temperature service. Types are either cone or plug and the valve seat ring and disk are of heat-treated stainless steel. All parts are made of steel; a long condensation chamber protects the life of packing; repacking is said to be simple because of a special stainless steel back seat and complete removal of gland bolts, allowing ample finger room.



WITH ganged arrangement of spindles this drilling machine is available for multi-hole work.

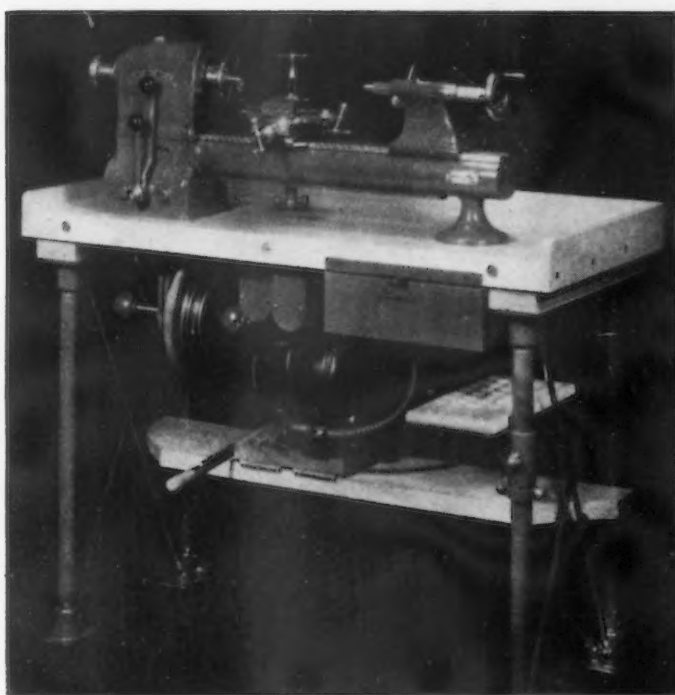


ABSENCE of impact is secured by air cushions automatically formed between springs and channels in the new valve design described.



Precision Bench Lathe Features Headstock Design

"CATARACT" precision ball-bearing bench lathes built by Hardinge Bros., Inc., Elmira, N. Y., have an electrical driving unit with a range of six each forward and reverse speeds from 230 to 2500 r.p.m. and a second unit having eight each forward and reverse speeds from 230 to 3900 r.p.m. obtained without use of gears, clutches or loose pulleys. A fully enclosed headstock provides for use of the Hardinge connected bearing in a manner said to fully meet the requirements of speed and accuracy in production, toolroom and laboratory departments. The spindle is hardened and ground internally and externally and is mounted on rotating members. The spindle pulley is provided with four holes for locking by means of a substantial pin at the rear of the headstock. The spindle nose may be either Hardinge patent paper or threaded. Each bearing section receives oil through cups located at the rear of the headstock. A mechanical brake is mounted within the enclosed headstock and is operated by a for-



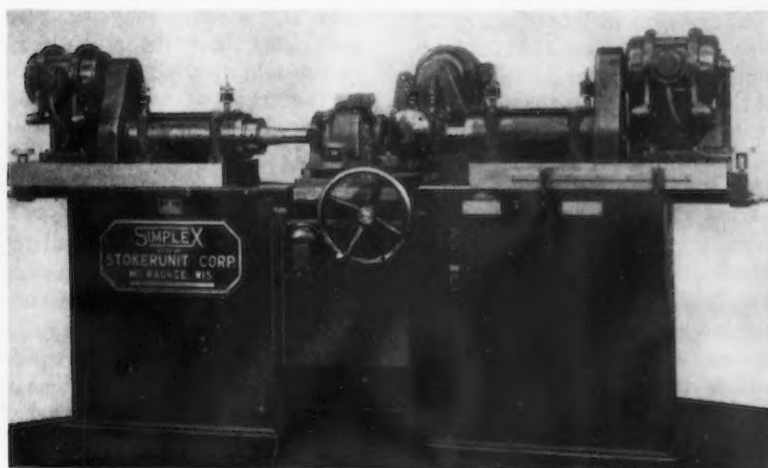
ward, stop and reverse control lever; the brake and brake band are arranged around the spindle and the band floats or rotates as the brake is applied; the action of the brake is positive and rapid but gradual. Various attachments provide that much precision hand-screw machine work can be done. The lathe is built in five sizes ranging in spindle capacity from $\frac{1}{2}$ to 1 in., and in swing over bed capacity from 7 to 9 in.

a platen to support and guide spindles. One or more spindles can be mounted on each platen. For manual cycle the platens are brought to the work by handwheel and a limit switch starts the spindles and engages the feed. A second switch stops the feed at the end of the cut and the platens are returned by handwheel. In the automatic cycle, electric operation does away with necessity for the handwheel. Each platen has individual adjustment in relation to work piece, but normally all platens feed at the same rate. Spindle speeds range from 300 to 5000 r.p.m. Net weight is 4800 lb.

Platen Mounted Units for Precision Boring

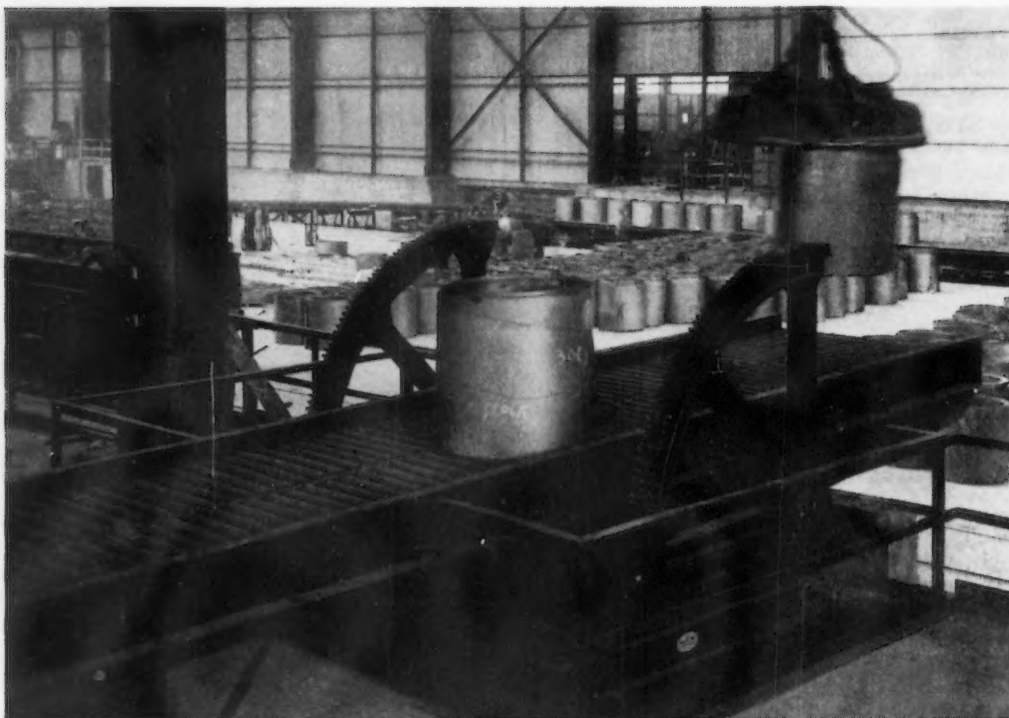
FLEXIBILITY of design provisions for permitting simultaneous precision boring of several different holes in multiple faces of a work piece, features the announce-

ment of a new boring machine by Stoker Unit Corpn., Milwaukee. The machine has a heavy cast iron bed with either two or three sets of V and flat ways. Each carries



Turntable Positioner For Heavy Welding

A TILTING turntable equipment for handling welding work up to four tons and designated as P-10 welding positioner is announced by the Harnischfeger Corpn., Milwaukee. The equipment consists of a 48-in. revolving table which is manually operated and turns on roller bearings. The table tilts to 90 deg. in one direction and to 45 deg. in the other. The tilting mechanism is powered by an electric motor driven through a double reduction bronze worm gear providing smooth movement which can be accurately stopped at any angle with push button control. The manual revolutions are self-locking in 50 positions. The flexibility of positioning allows that work shall always be in upright position for the proper flow of welding metal.



START of the gravity conveyor line in the hot strip and finishing department. The end of the conveyor which extends out over the side of the coil storage floor in the background is hinged and pivoted so that it may be raised up to allow head room for the passing of gondola cars on the track beneath. The magnet equipped overhead crane in the storage bay is depositing a coil on the end of the conveyor.

Hot Strip in 3200-Lb. Coils Handled Over

HOT strip steel in coils is kept in continuous flow from the hot strip mill to the hot strip finishing department at the McDonald Works of the Carnegie-Illinois Steel Corp., McDonald, Ohio, by an unique system of conveying equipment recently placed in operation. The coils of strip produced on the 43-in. continuous hot mill are carried over a system of conveyors having a total length of 458 ft. to a storage floor in the finishing department building. These coils weigh up to 9000 lb. and range from 12 to 38 in. in width.

From storage an overhead crane delivers the coils a short distance to another system of conveyors which delivers them to various processing equipment used in cold finishing.

Designed with unusual features to provide an efficient and speedy method of material handling so that there will be no delay in the

movement of coils of steel in large volume, the system installed in the finishing department is provided with electrically and pneumatically operated mechanical devices for upending the coils and diverting them at right angles over other conveyors to processing machinery and also with pneumatically operated braking mechanism at various points.

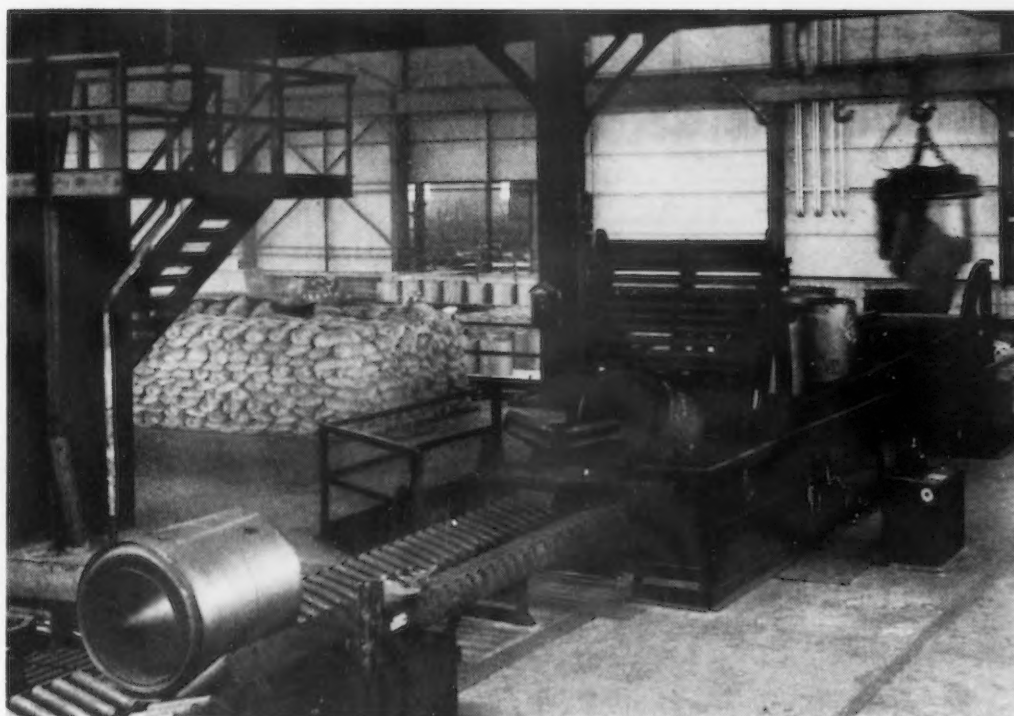
The system consists of a gravity roller conveyor line 117 ft. long, extending across the finishing bay, and three transfers, at right angles to the main conveyor, that deliver the coils to the processing machines and keep a supply of coils in front of the machines so that delays in receiving coils are avoided.

In constructing this conveyor it was necessary to extend its loading end out into the storage floor, which is depressed about 10 ft. below the floors in the other sections of the two finishing bays so that

the crane serving the storage bay could place coils on the conveyor. However, a stationary conveyor section would not have allowed clearance for gondola cars on a track located at the side of the storage floor. This problem was solved by the construction of a 16-ft. section of heavy-duty roller conveyor pivoted at one end. This pivoted conveyor section is lowered into the storage bay to receive coils from the crane, and when not in use is hinged up out of the way so that railroad cars can pass beneath. The hinged section weighs over 10 tons and it is operated by a 5-hp. motor connected to a speed-reducing drive.

After moving a short distance over the gravity conveyor the coils are slowed down by brakes under the rollers and move onto an electrically operated coil upender which turns them from a vertical to a horizontal position. Discharge of the coil onto the upender is

FROM the upender the coils are discharged onto a troughed conveyor and from that to tilting tables, one of which is shown at the left in this picture. These tilting tables deliver the coils to three other gravity conveyors located at right angles to the main conveyor line and these carry the coils down below the floor level to uncoilers at the processing equipment.



450-Ft. Conveyor System

F. L. PRENTISS

Cleveland Editor, *The Iron Age*

controlled by an automatically operated vertical stop in the conveyor line.

Straight Rollers on Receiving Section

The receiving section of the upender has straight rollers for handling coils vertically, while the rollers at the discharge section are troughed to handle them in a horizontal position. The upender is driven by a 7½-hp. motor.

The coils are upended one at a time and continue their movement on the troughed roller conveyor toward a series of tilting tables. These tilters, three in number, tilt at 10 deg., discharging the coils at right angles onto sections of three-rail roller gravity conveyors about 25 ft. long that extend a few feet below the floor level and deliver the coils to uncoilers at the processing equipment. The tilters are pneumatically operated on

three cradles mounted on flanged rollers.

The coils may be discharged by any one of the three tilting tables in the conveyor line. Each table is equipped with brakes so that the operator can stop a coil on whichever unit he wishes and discharge it onto the conveyor feeding any one of the three processing lines.

The rollers in the transfer conveyor are at very close centers so that the travel of the coils to the coil boxes will be as smooth as possible. At the end of each transverse conveyor line there is a heavy plate stop with an auxiliary roller stop. A roller is located at the top of the plate and this plate fits into the conveyor line when the plate is down, thus permitting a coil to pass. The roller stop is raised between the coil resting against the plate stop and the coil back of it so that when the plate stop is lowered only the coil directly back of it can move forward to the un-

coiler. Both plate and roller stops are pneumatically operated. A bank of several coils may be kept on each transfer conveyor, providing a reserve to assure continuous operation of the processing unit. Instruments for controlling the upender, tilting tables and transfer tables are conveniently located at the side of the conveyor.

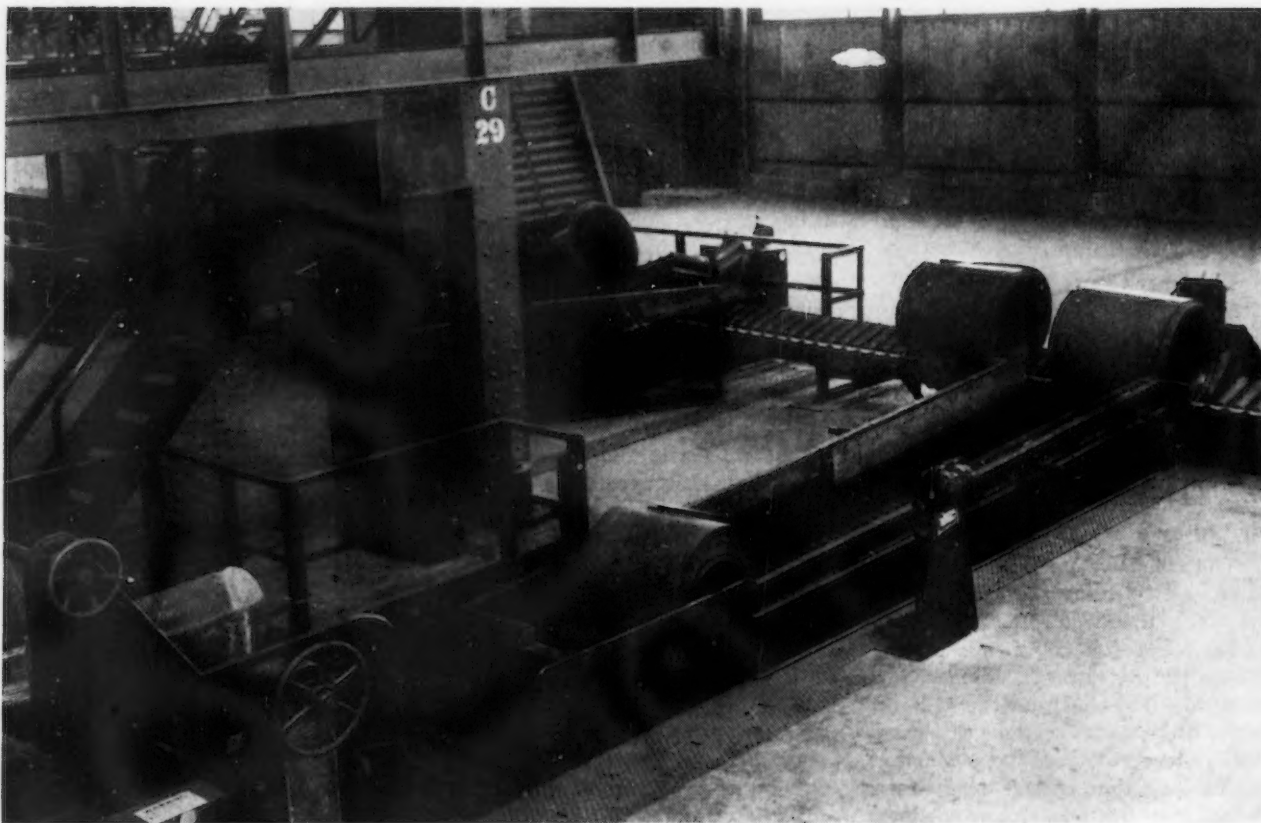
Passage Through Levelers

In the first processing line the strip passes through a five-roll leveler and a 17-roll leveler in order, to assure the perfect flatness of the stock, and is cut to length on a Holland shear with a capacity for cutting material up to ¼ in. thick. From the shear it goes to a gravity conveyor located just above the floor. It is stacked and pushed forward on this conveyor and the stacks are removed by an overhead crane and are taken further down into the finishing bay for whatever addi-



THE coils move along a short distance on the gravity conveyor and onto an upender which turns them from a vertical to a horizontal position.

o o o



THIS shows the upender partly concealed by the post, one of the tilting tables and conveyor that leads to one of the processing units. A stop near the end of this conveyor line holds the coils on the conveyor until they are released to the uncoiler in front of the processing equipment.

o o o

tional finishing operations may be required. Additional finishing equipment includes a Mesta pickling machine and a normalizing furnace.

The second processing line is for slitting strip. The steel passes through a five-roll leveler and then on a conveyor to the slitter, which has a capacity for slitting seven widths at a time. Beyond the slitters are two recoilers. All of the slitted material is recoiled. A

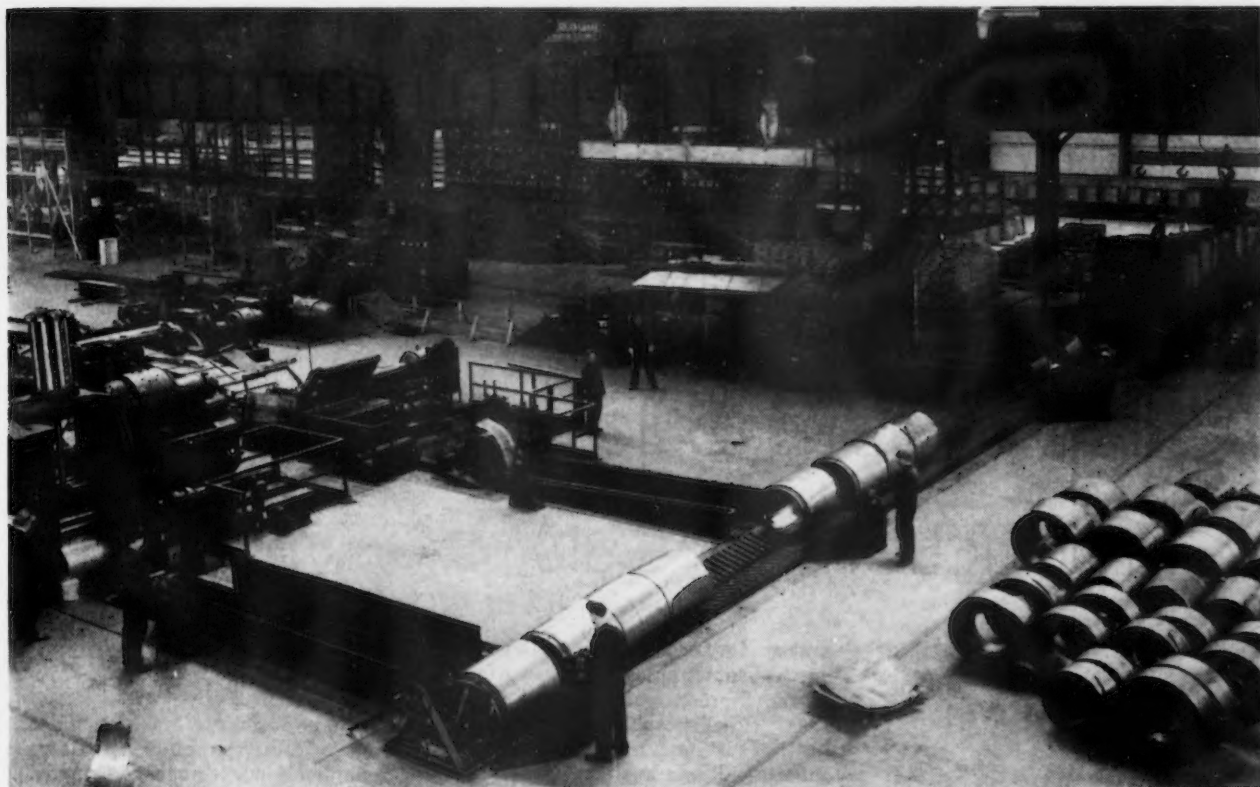
After the strip leaves the processing uncoiler it goes over a conveyor table to a 3-roll recoiler, and from there to a delivery table, and from there it is handled by a crane to a slitter line or shearing line, or to stock or railroad cars.

Transfer to Finishing Department

Handling from the hot mill coilers to the finishing department starts with the dumping of the coils from the two coilers into the

delivers the coils to a gravity section that carries them around the 90-deg. curve. This section has three sets of rollers and a roller guard is provided along the outer side.

After making the turn the coils move from this gravity conveyor to another drag-chain conveyor which takes them up a slight incline. At the end of this conveyor the coils pass onto a short gravity conveyor section which is provided



THIS is a graphic picture showing the complete layout of conveyors that feed the three lines of processing equipment.

scrap chopper cuts the sheared-off outer edges of the strip into 12 to 14-in. lengths to make this scrap convenient for handling.

The third processing line delivers the hot-rolled strip to a McKay processing uncoiler, which uncoils the strip, eliminates the cross or coil break and processes it so that it will not flute. With this processing it is stated that etching of the strip is avoided at the points where cross-breaks would appear if the steel is not given this processing.

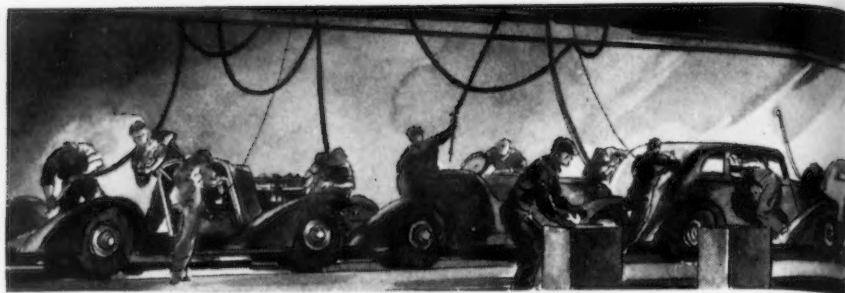
The McKay processing uncoiler has incorporated in its design a 5-roll leveller for flattening the strip after it has been processed.

basket of a transfer car, one car for each coiler. The basket is rotated 90 deg. and the weight of the coil then causes an additional 60-deg. drop. Then the car moves forward and dumps the coils on the conveyor line, which carries them through a tunnel under the finishing department and up to the side of the coil storage room. This conveyor is of the drag-chain type and the chain moves on rollers which carry the load. The distance between the rollers is somewhat less than the length of the chain links, which assures smoothness in operation. The conveyor line makes a right-angle turn near its center and at this point the drag chain

with automatic scales. A brake holds the coil stationary for a moment while it is being weighed. After they are weighed the coils continue to a pallet conveyor which carries them along in a straight line, and on this the coils are cooled before the crane removes them to the adjoining storage space.

The conveying equipment in the finishing department was supplied by the Mathews Conveyor Co., Ellwood City, Pa., which also furnished the curved section of the conveyor that leads to the storage room, as well as the rollers for the drag-chain conveyors that were installed by the Jeffrey Mfg. Co., Columbus, Ohio.

By FRANK J. OLIVER
Detroit Editor, The Iron Age



THIS WEEK ON THE

Floods Will Not Cripple Either Sales or Production of Cars

DETROIT, March 24.

REPORTS on early March sales have indicated an extremely active demand for all classes of cars. Typical of such activity is reported gains of 85 per cent by Studebaker over the first ten days last year and 117 per cent by Buick. Hudson sales for the first 14 days exceeded all previous marks for the corresponding period. Production in the automobile plants has been stepped up for the fourth consecutive week. Cram's reports estimate production of 95,223 units for the week ended March 21, as against 62,813 for the previous week and 62,813 for the February low point. In the meantime, Polk's estimate of February registrations has been revised from 160,000 to 170,000 units, based on returns from 34 states.

Undoubtedly, floods in the East

and in the upper Ohio valley will curtail retail sales in those areas, by how much yet remains to be seen. Steel companies having mills in the Pittsburgh area and along the Ohio River are much less seriously hampered in their operations and deliveries than anticipated, so there is no fear locally that motor-car production will be tied up to any extent.

Incidentally, sheet and strip seems to be the only classification noticeably affected by emergency-buying tactics. Orders and deliveries for heavier material, particularly forging stock, appear to be about normal in the face of increased plant activity in this area. In connection with firmer prices, it now appears that the deadline on deliveries under the old price structure is definitely set at April 15, and no later.

Business Will Soon Be as Usual

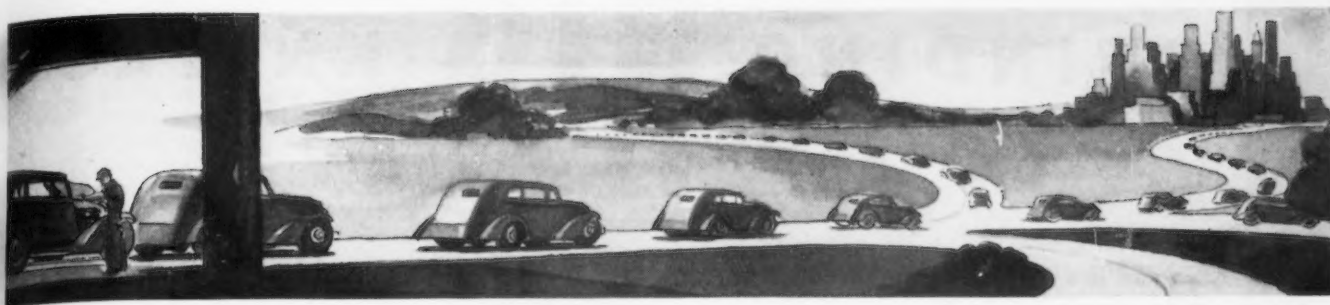
The chief uncertainty, as far as the steel situation is concerned in this area, has been the lack of communication with the mills. It was almost impossible to put through a telephone call to Pittsburgh in the past week, and Detroit

sales managers could not be very helpful in supplying their customers with information on operations, shipments or delivery. This situation has now been cleaned up.

Since the flood waters have receded rapidly, it will be a question of only a short time before the inundated areas will be carrying on business as usual. Except for this upset in the Eastern market, it looks as if automotive sales would be extremely active during April and May, as well as early June. Some optimists believe that production for the first half of 1936 will be 25 per cent above that of the first six months in 1935.

In the meantime, there is all kind of activity afoot in Detroit in connection with the 1937 models. Machinery dealers and sales representatives report a large volume of inquiries and orders are coming through fast. One comparatively small dealer reported orders of \$300,000 on his books at the present time.

It is pretty much of an accepted fact that we will see a large number of body changes next year, and in addition there will be a number of new departures in mechanical detail. Chevrolet, Oldsmobile, Packard and Chrysler are all figuring on new cylinder block line equipment at the present time. Such programs not only involve the replacement of obsolete equipment, but almost invariably mean that sweeping engineering changes contemplated over a period of several years will be brought to a head in a single model, to take advantage of the new tooling set-ups. Altogether, General Motors will spend \$50,000,000 this year on new machinery, plant changes and tool



ASSEMBLY LINE

costs for the new models. For the first time in several years, Chrysler will completely modernize one of its units on the type of program that Buick carried through last year at Flint. It is understood that over \$9,000,000 has been appropriated for equipment and building changes at the Jefferson Avenue plant, where Chrysler and DeSoto cars are made. Now that the corporation has shown such good earnings statements for the benefit of stockholders, it is beginning to plough back some of its surplus and depreciation reserve into new equipment. Of all the larger corporations in Detroit, Chrysler has been the most conservative during the depression years in spending money for machine tools and related machinery, and this move seems to be the first sign of a change in the corporation's equipment replacement policy.

Changes in New Chevrolet

Chevrolet's new engine block will have an L-head and will employ a thin-walled cast-steel piston, comparable in weight with an aluminum piston of the same size. Chevrolet has been using a cast iron piston in all previous production. Buick changed over from cast iron to aluminum pistons last year. Ford pioneered the thin-walled cast steel piston in the Lincoln Zephyr and has gradually been substituting pistons of this material for aluminum pistons in present Ford production. It is understood that about 5 per cent of 1936 Ford cars are coming off the line with steel pistons rather than aluminum and by the time the 1937 model is out, the change-over will be 100 per cent.

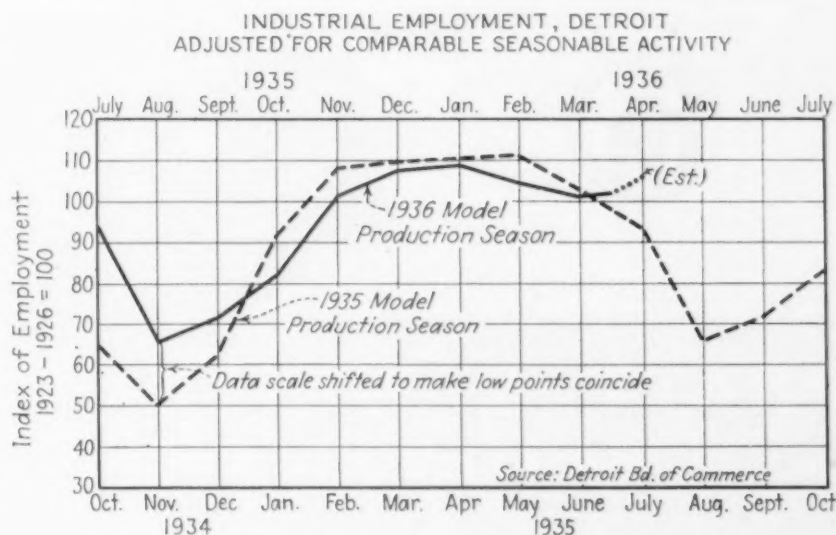
The new Chevrolet cast steel piston is dome-shaped and presents some unusual problems in manufacture because of the difficulty of chucking it internally and distortion in the machining operations, owing to the extremely thin wall. The skirt will be relieved much in the same way as the present Lincoln Zephyr is done.

In the meantime, it is said that Bohn Aluminum has been carrying on laboratory work on an entirely new type of reinforced aluminum piston containing a thermostat. The thermostat is intended to control piston expansion both as to amount and direction so as to overcome freezing when the piston is overheated and scuffing when it is cold. The piston is also said to have unusual oil economy, since it can be fitted much more closely than usual cast iron practice.

Speaking of motor components, a

parts supplier in Detroit is about to introduce a new device that, it is claimed, will completely eliminate oil changing through the use of an oil filter and conditioner. Tests show no deterioration in crankcase oil after 10,000 miles of operation with motors equipped with the new filters.

Mention was made recently of a polarized glass. Molded plastic glasses have been developed in Germany and have been used on the Continent in omnibuses and for the windows of the new Zeppelin soon to fly across the North Atlantic. This material, as made abroad, retains its transparency indefinitely, although attempts to duplicate it in this country have so far resulted in a material that develops opaqueness after a few months. Pittsburgh Plate Glass Co. announced recently the development of high-test laminated safety glass

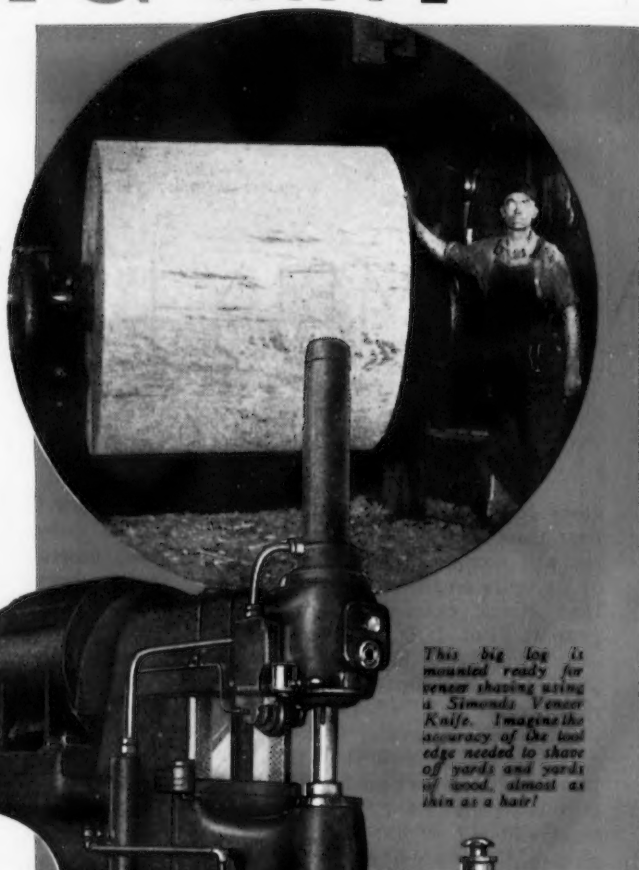


GRINDING **BIG** KNIVES IN A **BIG** WAY!

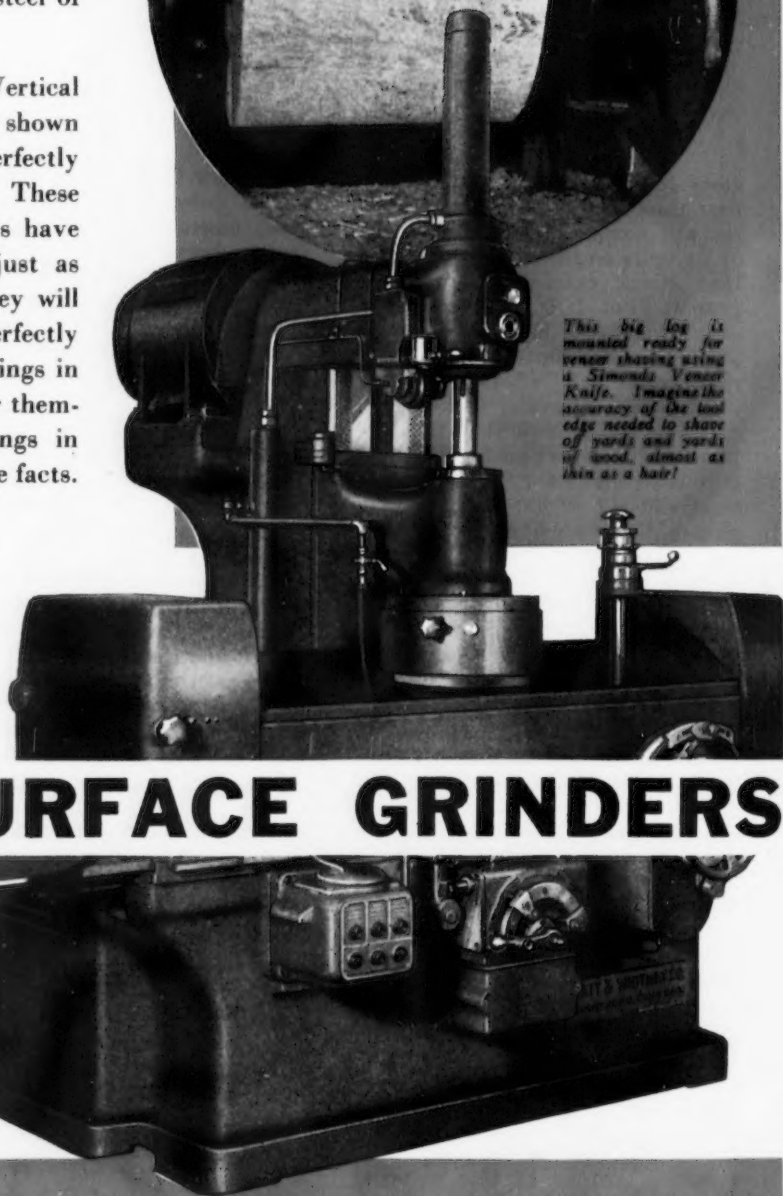
HERE is a big veneer knife — made by Simonds of Fitchburg. And since veneer cutting is one of the most difficult jobs, these famous knives must be ground with uncanny accuracy. They have to be razor sharp, as smooth as grease, with the extra strength that is in the special steel of which they are made.

Pratt & Whitney Hydraulic Vertical Surface Grinders — like the one shown here — do this difficult job perfectly and at astonishingly low costs. These rigid, accurate, husky machines have solved this job satisfactorily just as they will do in your case. They will grind almost any material perfectly and they show tremendous savings in time and money. They pay for themselves out of production savings in short order. Let us send you the facts.

Completely illustrated literature describing Pratt & Whitney Hydraulic Vertical Surface Grinders will be sent free to any executive requesting it on his company letterhead.



This big log is mounted ready for veneer shaving using a Simonds Veneer Knife. Imagine the accuracy of the tool edge needed to shave off yards and yards of wood, almost as thin as a hair!



HYDRAULIC VERTICAL SURFACE GRINDERS



PRATT & WHITNEY COMPANY
HARTFORD, CONN., U. S. A.

Branch Offices and Agencies: — BIRMINGHAM BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT
LOS ANGELES NEW YORK PHILADELPHIA PITTSBURGH ROCHESTER SAN FRANCISCO ST. LOUIS

which, after being cracked, will stretch and bend upon further impact. A great deal more strength and elasticity has been given the bonding material between the two outer pieces of glass. This bonding material is a new plastic called "Vinol," with rubber-like stretching qualities. It was developed by the company in connection with the Carbide & Carbon Chemicals Corp'n. after six years' research.

Plastic Fenders?

Some weeks ago it was intimated in these columns that experimental work was being carried on in the development of a plastic automobile body shell. This particular bit of information was dropped at the S.A.E. annual meeting in Detroit. Last week an expert in the plastic field appeared before the local S.A.E. group and rather "pooh-poohed" the idea that anything would be done along these lines in the near future. The most probable first application would be the use of composite cloth and synthetic resin, or laminated phenolics, applied to fenders. This material is very similar to that used in gear pinions at the present time.

Truck sales have been ascending since the first of the year despite weather and in January reached 42,000 units, an all-time high for that month. February truck sales are estimated to be only slightly lower, at 38,000 units. Expanding truck sales must necessarily mean more business being shipped by road than before and brings us to a consideration of the Motor Carrier Act, enacted in August, 1935. Common carriers are required to file tariffs with the new Bureau of Motor Carriers by March 25. The chief fact that was brought out recently in a transportation conference held in Detroit is that shippers are ignorant as a whole of their cost, probably doing a lot of guessing when it comes to rate setups. The most welcome feature of the act is the fact that it creates a central Federal bureau which in the long run will undoubtedly bring standardization to the truck field. Regulations as to length of vehicle, weight per axle, running and clearance lights, horns, mirrors and the like vary from state to state, and almost compel the redesign of a vehicle when it crosses certain state lines. Truck builders find their chief hope in the fact that uniformity in such regulations will probably be achieved ultimately. As it is now, every truck builder must supply a long list of options, which a transportation engineer must then adapt to existing laws in each state, a most disheartening business.

Strong British Steel Demand Continues—Expansion Delayed by Fuel Shortage

LONDON, March 23 (By Cable).—

In spite of record outputs iron and steel deliveries are still behind while a large volume of business remains to be placed. The eagerly awaited expansion of foundry iron production was delayed by a fuel shortage. Hematite supplies are small and export business is discouraged. Pressure for deliveries of semi-finished steel is unabated and higher prices are readily paid. Owing to pressing home demand finished steel export orders are being neglected. Structural activity is increasing and rolling stock makers are busier. There are heavy rail specifications. Price changes of heavy steel are under discussion but decision has been postponed until the beginning of April. A recent meeting of sheet makers surprisingly decided on no price advances. There is a slight improvement in tin plate export business and home consumers are covering present and future requirements.

Continental iron and steel is quieter, owing to international political tension, but works hold large orders.

Cartel prices for United Kingdom have advanced and a general export price advance is imminent.

Good progress in thin sheet negotiation and the early creation of an international black sheet organization is likely but German de-

mands are retarding the agreement on galvanized sheets.

The Belgian Government has approved the introduction of an export licensing system for certain steel products, to discourage illicit exports at below cartel prices.

New Design for Barrel Storage Racks

Barrett-Cravens' engineers have designed and patented a new rail clip that permits adjustment of barrel runners so that any type of drum or barrel may be stored in a standard storage rack. Heretofore, barrel runners were bolted in place which not only meant a fixed position and no means of adjustment, but in addition, it meant weakening the cross braces by punching holes in them.

This is eliminated with the adjustable clamp that permits moving the barrel runners in or out to conform to the container handled.

Another new feature in the Barrett barrel rack is the new tie-rod. The new design assures stronger racks because no holes are punched in the uprights, but are one solid piece. In addition, the design properly places the tie-rods at the extreme top and bottom where tightening should and best can be done.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9		
Billets, open-hearth	£5 17s.	6d. to	£6 2s. 6d.
Tin plate, per base box.....	18s.	9d. to	19s. 1½d.
Steel bars, open-hearth	£7 17½s.		
Beams, open-hearth	£7 12½s.		
Channels, open-hearth	£7 17½s.		
Angles, open-hearth	£7 12½s.		
Black sheets, No. 24 gage.....	£9 15s.		
Galvanized sheets, No. 24 gage....	£11 15s.		

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas. £2 7s.		
Wire rods, No. 5 B.W.G.	£4 10s.	
Steel bars, merchant	£3 5s.	
Sheet bars.....	£2 8s.	
Plate, ¾ in. and up	£4 6s.	6d.
Plate, 3/16 in. and 5 mm....	£4 5s.	
Sheets, ½ in....	£4 10s.	
Beams, Thomas. £3 2s.	6d.	
Angles (Basic)...	£3 2s.	6d.
Hoops and strip base	£4	
Wire, plain, No. 8	£5 7s.	6d.
Wire nails.....	£5 15s.	
Wire, barbed, 4 pt. No. 10 B.W.G.	£3 15s.	



PANORAMIC view of the "Golden Triangle" showing ravages a few hours before the flood crest was covered. Coal barges can be seen

Steel Industry Stages Quick R

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PITTSBURGH, March 24.—Staging a comeback that will go down in history as a modern example of resourcefulness and co-operation on the part of employees and management, the steel industry throughout the Pittsburgh and nearby districts has practically returned to a state of normalcy, following last week's devastating floods.

For the past four days open-hearth and Bessemer furnaces have been producing steel and practically all rolling mills in the larger plants have been going full tilt. This is hardly believable when it is realized that one week ago the entire city was in chaos. At that time one versed in steel operations would have been justified in predicting that it would take weeks to bring about a semblance of order.

However, in plants that were hard hit by water, steel furnaces

were being charged two days after the flood had reached its crest. In some of these mills water had reached the checkers and covered part of the soaking pits. In many of the smaller non-integrated mills along the rivers where debris and mud were washed over equipment and motors, buildings were placed in order in such time as to tax the imagination.

As long ago as last Saturday, many of the companies which did not have power plants of their own were all set to go, awaiting only the resumption of electric service. These spectacular results would have been impossible without the incredible endurance and high grade workmanship of those assigned to "get things going." Each company had its many problems and set about reestablishing order regardless of the fact that power was off, transportation was crippled, communication practically at a standstill and the air full of mournful cries from calamity howlers. There was suffering, hardships and sorrow but the people who had a job to do did it without thinking about anything else.

As soon, and in many cases before the water subsided, rehabilitation on a large scale went forward at all mills. Bearing tops were removed and all bearings cleaned and dried. Many motors were dried in place with warm blasts of air while in other cases the motors were taken apart and placed in ovens for thorough drying before being cleaned of mud and debris. Meanwhile large forces of workmen set to work removing mud and debris strewn throughout the plants. In some plants river pumps that had been disabled were put in working order in record time as water for cooling purposes was one of the important items necessary for the resumption of operations.

In many manufacturing plants wise foremen, expecting abnormally high waters, had unbolted motors and machinery moving it by cranes to high spots where it remained out of danger until the water had subsided. In practically all cases rehabilitation took place in a surprisingly short time. Workmen and officials toiled in many cases for 36 to 40 hr. at a single stretch until the danger of pro-



reached. By the time the peak occurred the tops of the train sheds in the depot were completely practically up against buildings.

Recovery From Flood Damage

By THOMAS C. CAMPBELL
Pittsburgh Editor, The Iron Age

longed shutdown was completely alleviated.

Damage Difficult to Estimate

Damage both direct and indirect to steel and manufacturing plants in the vicinity of Pittsburgh will run into millions. Positive amounts will probably never be known as items of loss of business and repairing of equipment will be continually coming to light. Much equipment that is now running under pressure of getting out orders will no doubt have to be replaced. Major repairs will be necessary on other machinery both mechanical and electrical. However, such replacements and repairs can be made later when serious interference to production will be lacking.

Two large plants of the leading producer in the Pittsburgh area were able to go through the flood without a halt in operations. Plants of the leading independent were down only a few days. Mills of a Pittsburgh producer at Monessen and Allentown were able to go through the flood with only a minor shutdown. Shipments were moving

out of this plant last Friday morning. The leading strip mill interests have been operating and moving steel since last Saturday.

Water 18 Ft. Deep in Plants

In many of the smaller plants operations were at a standstill for three or four days due to lack of power as they depended upon current from the power companies. However, even some of the worst affected in this district were ready to go forward by Sunday at the latest. Water in some instances rose 10 to 18 ft. in finishing mills. Checkers on open-hearths were covered in some cases while in some mills soaking pits were partially filled. Railroad tracks leading to various works were inundated, freight cars being completely covered. Communication to and from the mills was at a standstill. Some of the rehabilitation was done in almost total darkness but it was done and often officials miles away, keeping track of the work going forward, were astounded at the results.

While stocks of steel in many yards were covered with mud and

silt, for the most part, they will be put in shape easily. Stocks of tin plate in some of the plants were inundated but as soon as the waters receded much of this material was washed and repacked. Large tonnages of tin plate at a local plant were released for immediate shipment by leading can companies last Friday. Kegs of nails and large quantities of small shapes and bars were reconditioned.

Railroads Cooperated Fully

One unusual case developed when two large steel coal barges were deposited upon the main tracks of one of the railroads. Working against great difficulties the coal was removed from the barges and the latter cleared from the tracks, opening up the main lines so that a through route was possible to Youngstown and the West. Meanwhile, other roads were dumping fill and repairing the damage done to the tracks. By Sunday evening traffic was flowing rather freely from the city.

While recovery work was going forward at the mills the business
(CONTINUED ON PAGE 86)



THIS WEEK IN WASHINGTON

Passage of Wheeler-Utterback anti-basing point bill seems more doubtful as strong arguments against it are made.

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Scrap sellers join steel industry in opposing bill.

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New Deal attacks on business multiply as President asks industry for more cooperation in reemployment.

o o o

Federal Trade Commission moves against tin plate makers.

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Action is taken to divest industries of privately operated railroads.

BY L. W. MOFFETT
Resident Washington Editor,
The Iron Age

o o o

WASHINGTON, March 24. —The Wheeler-Utterback bill, in Federal Trade Commission style, would tear out by its roots the basing point price system used by the steel and a number of other industries. . . . The FTC is conducting a Presidential order "investigation" into alleged collusive bidding by makers of sheet steel piling and has just issued a complaint against tin plate manufacturers for refusing to sell stock plate at bargain prices. . . . The Wheeler-Rayburn bill would authorize the commission to snoop into the affairs of individuals, partnerships and corporations and determine and punish to suit itself those held to be guilty of an "unfair or deceptive" practice. . . . The Healey (former Walsh) Government contracts bill would regiment industry so far as its imponderable provi-

sions would make possible. . . . The O'Mahoney bill would place industry under a rigid system of bureaucratic licensing. . . . Class tax legislation that will eat surpluses and reserves so necessary to maintain payrolls and for modernization of plants is headed for enactment. . . . Investigations galore are under way or in the making. . . . A translated OGPU, under the mask of self-righteousness, plunders files of American telegraph offices in order to seize evidence against opponents of the Administration. . . .

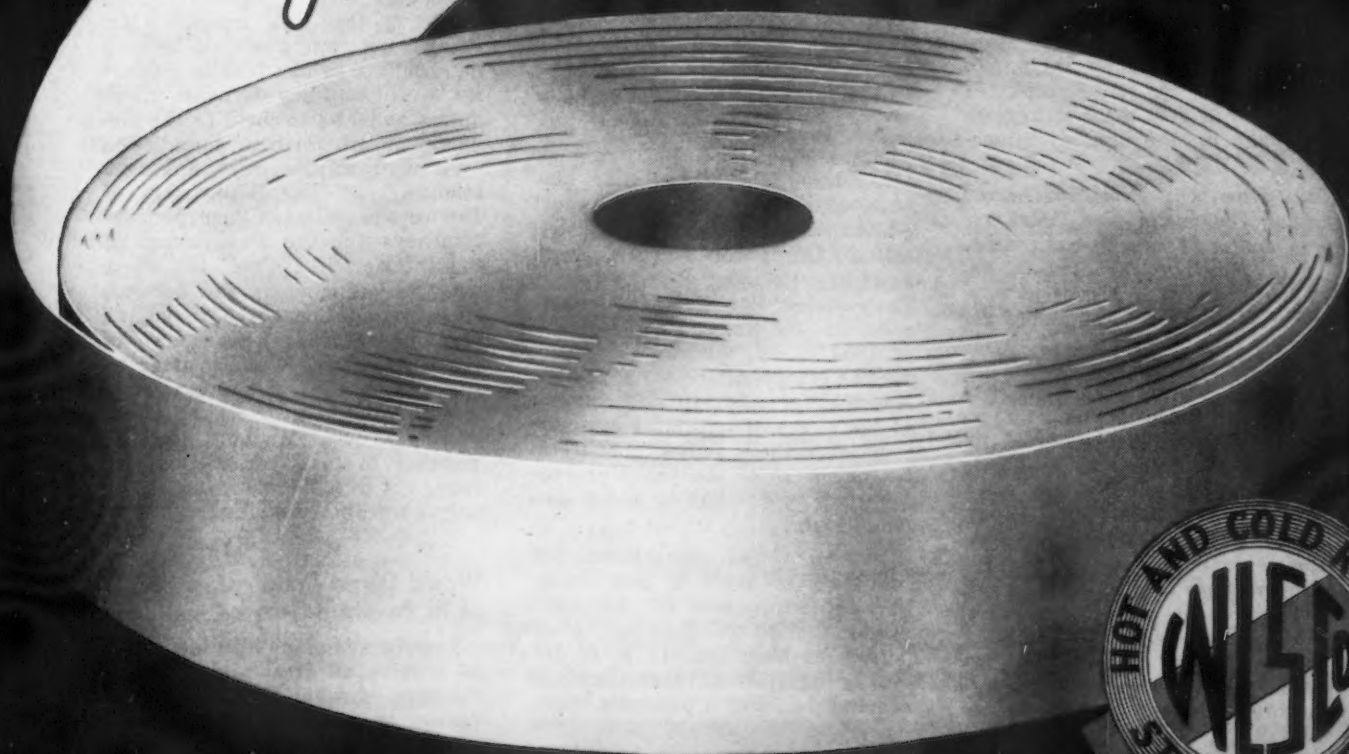
Many investigations should be made. . . . Congress not only is justified in making them, but would be shirking its duties if it did not. . . . But it shirks a WPA investigation. . . . It may well be that some of the charges of political graft, of the misuse of millions upon millions of dollars of taxpayers' money is without justification. . . . But if the smell is not there it would seem that the holier-than-thou boys would be the most anx-

ious to raise the lid and disclose to the country the purity of the odor. . . . Certainly the country is not naive enough to accept a Hopkins whitewash. . . . Neither will it be satisfied with the "findings" of a politically biased Senate committee or any other inquiry made only for political and punitive purposes. . . .

The list of legislative pills and administrative activities cited is far from complete. . . . It is hardly a modicum of the total. . . . And it does not include what has gone before, that is prior to what has been sardonically called the "breathing spell" for business. . . . It is easy to see, however, why industry remains on the anxious seat, and, though making gains despite the baiting process, continues to be jittery. . . .

Yet the President in another stupefying message, this time asking for an additional \$1,500,000,000 for relief, lays at the door of private industry the responsibility for the unemployment situation.

Continuous Improvement!



* Deep drawing in 1897 was nothing as compared with present day performance. The presses and the strip steel used in them had hardly more than started their march of progress in 1897. That was the year and the state of the industry when West Leechburg Steel Company started the production of strip steel. * Keeping pace with press developments and the increasingly exacting requirements of press users, West Leechburg Steel Company has achieved continuous improvement for 39 years in the manufacture of strip steel that makes today's stampings a work of art as well as of utility. * We make only one product—strip steel, and we make it good in various grades. This good strip steel is delivered promptly on schedule. Try it!

WEST LEECHBURG STEEL COMPANY

General Offices: UNION BANK BLDG., PITTSBURGH, PA.

Branch Sales Offices:

NEW YORK • CHICAGO • DETROIT • CLEVELAND • DAYTON • ST. LOUIS • TOLEDO • [Dean Higgins & Co.] • NEWARK
PHILADELPHIA • TORONTO, ONT. [Jessop Steel Co.] • BUFFALO — ROCHESTER — SYRACUSE [Brace-Mueller-Huntley, Inc.]

Warehouse: JOS. T. RYERSON & SON

ALL GRADES OF ALLEGHENY STAINLESS IN STRIP FORM

... On the one hand Washington fires legislative and administrative brickbats at industry as it endeavors to increase employment and dig its way out of the depression, while, on the other hand, the President scolds manufacturers for not increasing employment and production in order to cut relief costs. ... New Deal ballyhoo, in moments of political self-adulation, conveniently overlooks the fearsome unemployment situation and huge relief rolls, and asks the voters to behold the recovery the New Deal has brought about. ... Prosperity is not "just around the corner." ... It is here, fully panoplied, gaily marching in a joyous America, remade by the economic planners of the more abundant life. ... Phalanx upon phalanx from the ranks of all industry and business make up a solid array in a parade attuned to the Main street step of "Happy Days Are Here Again." ... Except, of course, for a few dour stragglers who make up the "greedy minority." ...

But when the President makes another congenital New Deal request for a Treasury appropriation of astronomical proportions, the blame for its necessity to take care of the scarcely diminished relief rolls is laid at the door of industry and of the Supreme Court of the United States. ... This puts industry in good company. ... The New Deal is unable to restrain its resentment against the country's highest judicial tribunal any more than it can withhold its feeling against anything that blocks its Utopian path. ... Of course, resentment gives way to praise when court decisions favor the New Deal. ... The jab at the court in the latest relief message was inspired by the "horse and buggy" Schechter decision. ... The ironic thing is that that decision, which knocked out NRA, was the best thing that has yet happened to the New Deal. ... For it was immediately followed by industrial stimulation and employment gains. ... Moreover NRA, instead of being the boon for industry and labor that was claimed for it, was a retarding influence. This was shown by the fact that it broke down under its own weight because large sections of business and industry could not operate under its heavy costs which consumers were unable to absorb. ... And it may be predicted that, despite efforts of Maj. George L. Berry, through his Council for Industrial Progress, another NRA will not be created. ...

Circumvention of the NRA decision, particularly because of Congressional and public opposi-

Floods Delay Delivery of The Iron Age

If your copy of the Mar. 19 issue of *The Iron Age* reached you late, you can blame the floods. The entire issue was mailed on time, but mail trains were seriously delayed by flood conditions.

We hope this issue arrives at the usual time.

tion, will be found quite different from the bold circumvention of the Supreme Court's AAA decision. ... There is not at hand a subterfuge to escape the NRA decision such as the so-called soil conservation act is for AAA. ...

Farmers' Surplus Goes On and On

The farmers' "chronic surplus problem goes on," the President said, when he signed the new \$440,000,000 farm act. ... Export markets have not been lost by reason of the program of scarcity, according to the President. They were "lost following enactment of the Smoot-Hawley tariff of 1930." ... "Although the production control programs have been stopped, farmers are not entirely at the mercy of unbridled competition with their fellow producers, as they were in the years preceding 1933," ... that is, before the New Deal. ...

Yet unbridled competition for the steel industry is the theme song of supporters of the anti-basing point bill and of some prominent New Dealers as is unlimited production regardless of demand. ... But a precisely opposite policy is being applied to agriculture which is being paid from the Federal treasury, while industry, far from being paid, is being panned and taxed. ... Secretary of the Interior Ickes, no doubt reflecting a widely held feeling within the New Deal, has said that industry is not helping at all in the way of cooperating with the Government in overcoming unemployment. ... Industry may well respond that even for self-interest it is doing all it can to increase production and employment as a means to profits. ... Whether sneering critics will grant it or not, it is just as responsive as are the Washington spenders of industry's and other taxpayers' money to human suffering. ... It is well aware that if it can cut down relief rolls it automatically reduces or should reduce taxation, if politicians will permit. ... And indus-

try might well ask what the Government is doing to cooperate with industry. ... Industry might tell Washington that it would be helpful and confidence-inspiring if it would call off its blanket indictments and wholesale legislative attacks and confine its punitive acts to actual abuses, not imaginary ones born of political expediency and even of personal spite. ...

"Big business," however, must not think it has a monopoly on dislikes of New Dealers. ... For many of them are the epitome of what they themselves jeeringly refer to as "rugged individualists" when in the frequent throes of Hoover-phobia. ... Hence they are so constituted temperamentally that they engage in lively spats among themselves. ... Such spats generally arise over love of authority. ... So it is that the irascible Mr. Ickes is not feeling so good because he came out second best in a quarrel with Attorney General Cummings and had to yield to the Department of Justice jurisdiction over civil affairs of the Virgin Islands. ... The Department of Justice was called a "usurper" by attorneys for the Department of the Interior. ... Then, too, there was the recent merry row between Secretary of Commerce Roper and Madame Perkins, Secretary of Labor. ... Mr. Roper insisted on jurisdiction over a sailors' strike in California. ... He said it was mutiny. ... Madame Perkins, wanting to take jurisdiction and eager not to ruffle labor, said it was only an ordinary strike. ...

Would Divest Industry of Its Private Railroads

Interpreted as an opening attack to deprive all steel and other industries of what it calls common carrier railroads, the Department of Justice last Thursday filed a brief with the Supreme Court in its case against the Elgin, Joliet & Eastern railroad, subsidiary of the United States Steel Corp. The brief was submitted on appeal from the District Court of the United States for the Northern District of Illinois which dismissed the Government's petition. The petition charges that ownership of this important key rail line and of subsidiary producing companies by a holding company constitutes a violation of the commodities clause of the Interstate Commerce Act.

The commerce clause prohibits transportation by any railroad of any article or commodity, other than timber and timber products, in which it may have any interest direct or indirect, except such articles or commodities as may be

necessary and intended for use in the conduct of its business.

The Government brief said that the more important issues presented are:

"Whether, when a holding company owns a subsidiary railroad company and also subsidiary producing companies, the railroad company has an interest within the meaning of the commodities clause in the commodities owned by the producing companies.

"Whether, if in order to establish a violation of the commodities clause in such a case it is necessary to show that the holding company in practice dominates, supervises, and directs the affairs of the railroad company and the producing companies as departments or branches of one industrial organization, such a showing has been made in the present case.

"Whether there is anything in (a) the character of the service which appellee performs for the industry with which it is affiliated or (b) the manner in which the affiliation exists, that is, by ownership of the stock of appellee, which prevents the commodities clause from being applicable to the transportation of the commodities in question."

The case is expected to be argued about April 8. As yet, the reply brief has not been filed. Signing the Government brief are Solicitor General Stanley Reed and other Department of Justice attorneys, together with Burt L. Smelker, attorney for the Interstate Commerce Commission.

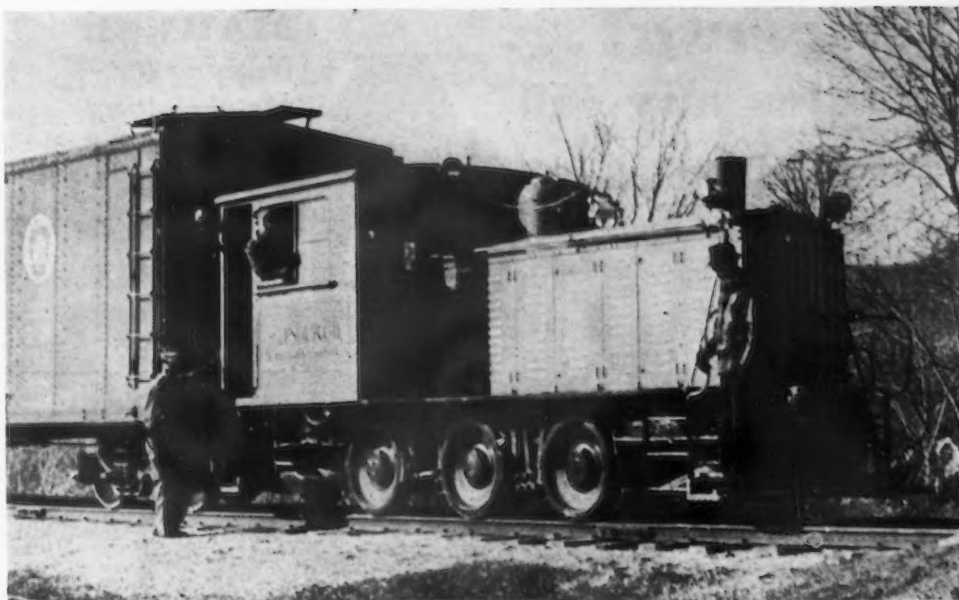
The brief points out that the E., J. & E. operates a line of railroad extending from Waukegan, Ill., to Porter, Ind., and that it is a "most strategically located road, connecting with every railroad entering the city of Chicago" and that it serves the Illinois Steel Co., Steel Corporation subsidiary, together with rival steel companies and shippers generally. The charge is made that ownership by the United States Steel Corp. of the stock of the railroad and of

the producing subsidiaries "is employed in a manner not normal and usual with ordinary stockholders, but is so used as to dominate and control their respective affairs and to bring them under coordinated control, management and direction of the United States Steel Corpn."

Contention is made that neither the railroad nor any of the producing subsidiaries is free to control and manage its own affairs independently of the United States Steel Corpn.; that they are in re-

ality one and the same organization controlled by the corporation, and that the commodities are mined, manufactured, produced and transported under the latter's authority. By reason of these allegations, it is charged that the railroad has such an interest in the commodities of the producing subsidiaries as to render their transportation in interstate commerce unlawful under the commodities clause.

In its answer in the lower court



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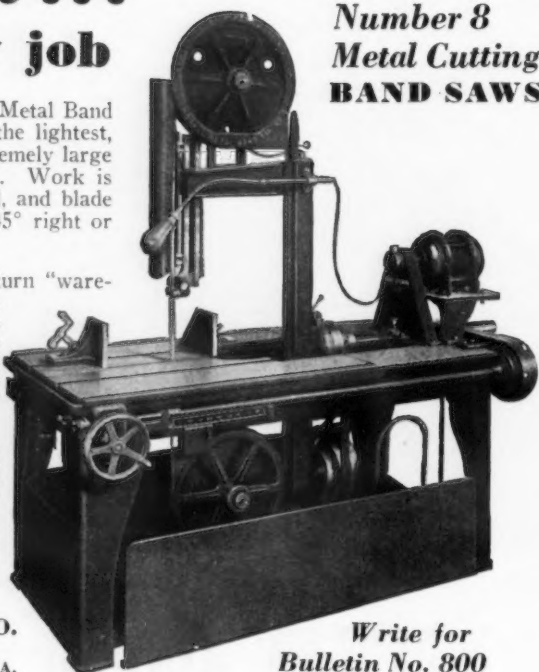
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the railroad company denied allegation regarding relations, other than stock ownership, between the Steel Corporation and the producing subsidiaries and denied generally the allegation as to relations, other than stock ownership, between the Steel Corporation and the railroad. It also was held that the railroad is an industrial railroad whose principal service is performed for the subsidiaries of the Steel Corporation and that, as such, the transportation by it of the commodities of such subsidiaries is not prohibited by the commodities clause.

Voluminous evidence also submitted by the railroad company indicated that it maintains separate accounts, in conformity with requirements of the Interstate Commerce Commission. Testimony was offered by shippers over its line to the effect that they receive good service and do not come in contact with officials of the United States Steel Corp. or of its producing subsidiaries. Testimony was also offered by traffic officers of several connecting railroads saying that they receive fair treatment from the E. J. & E. in the matter of divisions and that producing subsidiaries of the Steel Corporation do not issue instructions to the railroad concerning its operation or the making of divisions.

The lower court rejected findings requested by the Government, and in entering a decree dismissing the petition for want of equity, approved findings requested by the railroad. The court held that "no

single piece of evidence taken alone, nor all taken together and considered as a whole, warrant the inference that the defendant and the producing and manufacturing subsidiaries are under the domination, control, direction, and management of the Steel Corporation, in the sense that the defendant and the other subsidiaries are mere departments, branches, adjuncts and instrumentalities of the Steel Corporation." It was also held by the court that "the evidence fails to show that the defendant has any interest, direct or indirect, legal or equitable, in the articles or commodities which it transports for the subsidiaries of the Steel Corporation."

The Government brief attacks at great length findings of the lower court to show that it erred in its opinion. It also attacks the railroad's contention that it is a terminal or industrial railroad, holding that it is a common carrier.

Tin Plate Makers Attacked by FTC

Fifteen companies engaged in the manufacture of tin plate are charged with violation of the Federal Trade Commission Act, in a complaint issued by that commission. The complaint alleges that the respondents entered into an agreement under which they have refused to sell a certain grade of their product, known as "stock plate," to jobbers of tin plate and small manufacturers of tin cans and other metal containers. Thereby, the complainant charges,

the respondents have arbitrarily and unduly enhanced the prices which jobbers and manufacturers must pay for a higher grade of plate sold by the same respondent companies.

The complaint also alleges that the respondents' practices tend to lessen and suppress competition in the sale of tin plate, and to create a monopoly in the manufacture of tin containers on the part of the American Can Co. and the Continental Can Co., which together consume approximately 65 per cent of the production of tin plate.

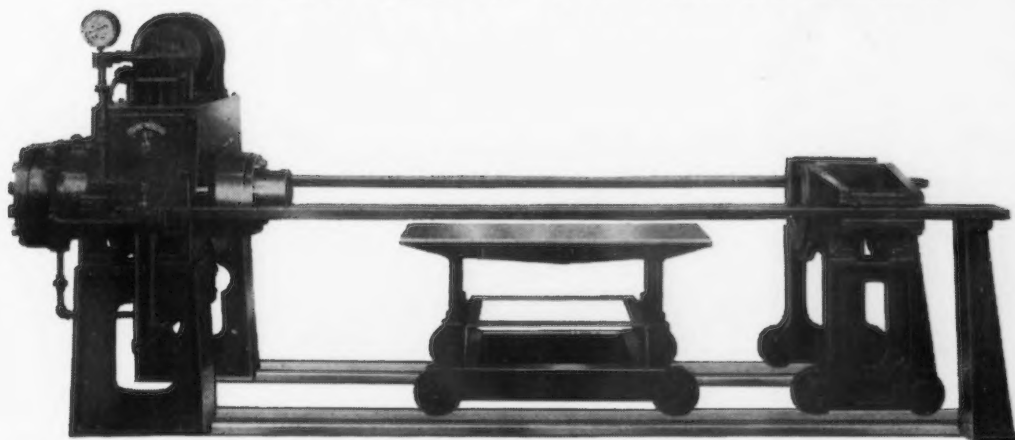
The respondents are: American Sheet & Tin Plate Co., Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa.; Canton Tin Plate Corp., Canton, Ohio; Columbia Steel Co., San Francisco; John Follansbee, George T. Ladd and Isaac M. Scott, trustees in bankruptcy for Follansbee Brothers Co., Pittsburgh; Granite City Steel Co., Granite City, Ill.; Inland Steel Co., Chicago; Jones & Laughlin Steel Corp., Pittsburgh; McKeesport Tin Plate Co., McKeesport, Pa.; Republic Steel Corp., Youngstown; N. & G. Taylor Co., Cumberland, Md.; Washington Tin Plate Co., Washington, Pa.; Weirton Steel Co., Weirton, W. Va.; Wheeling Steel Corp., Wheeling, W. Va.; and Youngstown Sheet & Tube Co., Youngstown.

The complaint says that the respondents produce three grades of tin plate, namely, "production plate," which constitutes the bulk of the tin plate they manufacture, and which is made in accordance with customers' specifications; "stock plate," designated as "overruns" and "seconds," which, because of the difficulty in controlling production in the manufacture of "production plate," is accumulated in large quantities, and for which the respondents do not have specific orders, and "waste-waste," which contains defects so great that it cannot qualify as "seconds."

According to the complaint, the respondent companies, in October, 1934, entered into the alleged combination to eliminate competition in the sale of "stock plate" by agreeing not to quote prices on such grade of tin plate nor to offer the same for sale to jobbers and to small can manufacturers, who, because of lack of financial capacity, were unable to carry "production plate" in stock.

Since January, 1935, it is alleged, the respondents, by refusing to sell "stock plate," have accumulated such quantities of it and have cut it into such shape that it cannot be used by jobbers and small manufacturers of tin cans, and it now is classified as "waste-waste,"

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being sold as such for domestic consumption and for export, although in the latter case the shape is not mutilated.

The result of these alleged acts, the complaint charges, tends to increase the prices of tin plate above the prices which prevailed in the past and which would prevail under normal and open competition among the respondents, and tends to force jobbers of tin plate out of business.

The commission fixed April 17, next, as the final date for the respondents to show cause why an order to cease and desist from the practices complained of should not be issued against them.

Approves Lower Freight Rates to Pacific Coast on Wire Rods

The Interstate Commerce Commission has found justified proposed reduced all-rail and water-rail rates on wire rods in carloads from eastern transcontinental groups to Pacific Coast terminal and intermediate points and ordered them effective March 23. The origin groups include the territory between Denver on the west

and Chicago and Birmingham on the east and the piers on the Atlantic Seaboard of the Clyde-Mallory and Morgan lines.

The new rate to San Francisco is \$14.30 per ton from Chicago, Birmingham and Sparrows Point, Md., a reduction of \$8.25 from Chicago, and is expected to open the market for makers in that district. The controversy centered around the proposed rate in its application from the Chicago district, the commission said, there being no suggestion that it will move any traffic from the other points from which it was made in order to maintain the customary relation to Chicago.

Proposes Reduced Freight Rates on Steel Beer Barrels

Examiner C. E. Simmons of the Interstate Commerce Commission in a proposed report has recommended that rates on iron or steel barrels and kegs in carloads from points in Illinois, Michigan and Wisconsin to destinations in Colorado be reduced. He recommended establishment of graduated percentage rates based on weights.

The following percentages of the first-class rates were recommended:

14,000-lb., 55 per cent; 20,000-lb., 50 per cent; 30,000-lb., 40 per cent; 36,000-lb., 37.5 per cent and 40,000-lb., 35 per cent. The examiner said that obviously the spread between the rates on iron or steel barrels and those on wooden barrels is too great.

"The iron or steel barrels here considered are used for the transportation of beer," said the report. "Following the repeal of the 18th amendment in 1933 the brewers were faced with a shortage of wooden barrels and kegs. As a result the steel barrel came into extensive use as a substitute for the wooden barrel. Complainants are gradually replacing their wooden barrels with iron or steel barrels. These barrels are used repeatedly in the transportation of beer. Damaged or defective iron or steel barrels cannot be repaired and are replaced with new ones."

The complainants are brewing interests in Colorado. Shipments move from Chicago and West Pullman, Ill., Milwaukee and West Allis, Wis., and Detroit.



W. S. TOWER

Passage of Anti-Basing Point Bill Now More Doubtful—Steel Makers Continue Arguments Against It

vard University, will appear before the committee on Friday.

Another witness called by Senator Wheeler to aid passage of the bill was Robert E. Freer, a member of the Federal Trade Commission, who in testimony yesterday, again argued for the FTC's traditional stand in favor of an f. o. b. mill pricing system.

Although supporters of the bill are submitting evidence in its favor, steel makers are vigorously attacking the proposed legislation. Both large and small producers are presenting vital testimony to show that the bill, if enacted, would break down the price structure, drive the smaller companies out of business, create widespread unemployment and centralize the industry in large consuming centers. The testimony of Walter S. Tower, executive secretary, American Iron and Steel Institute, was particularly effective.

While testimony of steel witnesses was temporarily completed today with the appearance of Paul Mac-kall, vice-president, Bethlehem

Steel Corp., and the reappearance of George L. Gordon, general sales manager, Lukens Steel Co., Chairman Wheeler said that he "hopes" to have William A. Irvin, president, United States Steel Corp., and E. G. Grace, president, Bethlehem Steel Corp., appear before the committee. He also threatened to subpoena the records of these two companies in order to determine what effect his bill would have on the industry.

The steel scrap industry also attacked a section of the bill requiring shippers to show freight charges included in shipments. It was stated that by reason of the nature of the scrap business this would be an almost impossible task and would disrupt the industry since it does not obtain its material from any single source.

Senator Wheeler showed a sympathetic attitude toward this argument and indicated that if he concluded the bill would have such a result he would make the necessary amendment to the objectionable section to avoid such a development.

While Senator Wheeler and other supporters of the bill have not adopted a more moderate tone toward the proposed legislation, it is clear that testimony of steel witnesses has altered their views to some extent. There is also a growing belief, which now borders on conviction, that the bill will not be enacted at the present session, if at all. There is even doubt that it will be reported out by the Senate committee. A poll of the Senate itself, taken by the *Congressional Intelligence*, has shown that 38 Senators are opposed to the bill while 30 are in favor of it. The rest are undecided.

Mr. Tower Insisted That Records Be Correct

Walter S. Tower, executive secretary of the American Iron and Steel Institute, stoutly supported the basing point method of quoting steel prices. In the course of four hours' testimony, he engaged in pointed exchanges with Senator Wheeler. Mr. Tower was determined in his insistence upon a careful and accurate presentation of replies. Senator Wheeler, who did

WASHINGTON, March 24.—That hearings before the Senate Committee on Interstate Commerce on the Wheeler-Utterback anti-basing point bill are to be prolonged further was made evident by Senator Wheeler's announcement yesterday that Prof. O. M. Sprague, formerly of Har-



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virtually all of the examining of Mr. Tower, appeared to strongly resent it when Mr. Tower took exception to some of the Senator's observations, especially when the latter were offered before Mr. Tower was given opportunity to complete statements.

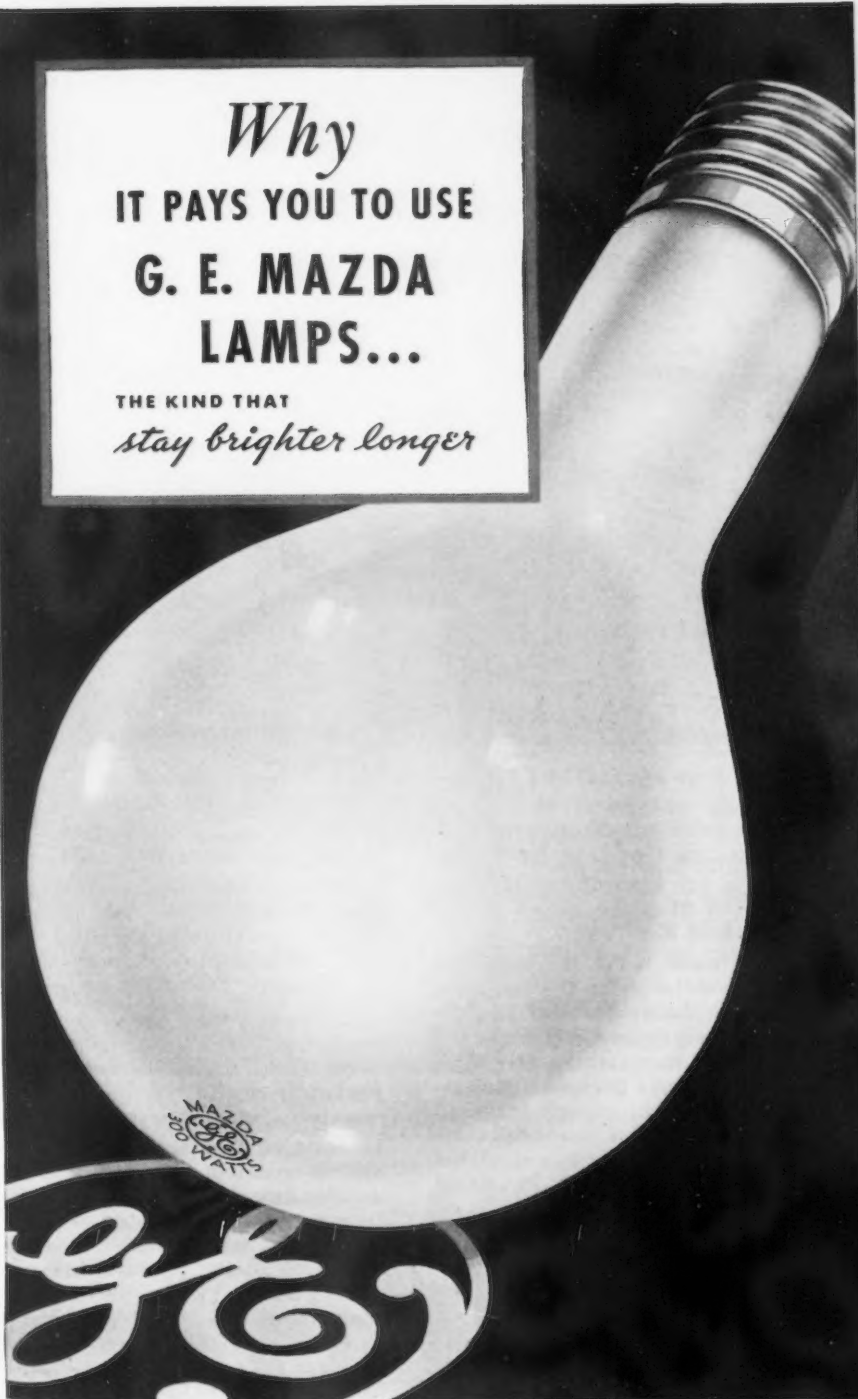
For the most part, Senator Wheeler adopted the role of a prosecutor. Without any basis for his conclusions, he directed charges of price fixing against the institute and the industry. Mr. Tower remained cool, but was firm in combating the Senator's fire and setting forth the position of the institute and of the industry insofar as he could speak for the latter.

Senator Wheeler became choleric when Mr. Tower said he could see no connection between the method of quoting prices and of code operations. The Senator explosively declared that the committee did not propose to submit to a "lecture" by Mr. Tower and said it was for the committee itself to bring out whatever testimony it pleased. Mr. Tower offered the suggestion after Senator Wheeler had tediously droned on for a long time on the policy of the Steel Code Authority, made up of directors of the American Iron and Steel Institute, particularly with regard to assessment of liquidated damages for code violations. Armed with the Federal Trade Commission Report on the basing point system in the steel industry, the Senator read a long list of what he called "fines," and asked about uniform extras published by the code authority. The plain implication of his heckling was to show that prices were fixed and enforced by means of penalties. Though Mr. Tower repeatedly said he could not possibly remember details of the instances cited, some of which he was never aware, Senator Wheeler continued his tiresome reading. When Mr. Tower suggested he saw no connection with old code operations and the bill, the Senator, enraged at the "lecture," insisted that the basing point method was used to "fix" code prices.

Institute Did Not Draw Up Code

Senator Wheeler inquired as to the names of the institute personnel, its duties, etc., and when Mr. Tower was asked if he agreed with Donald Richberg's statement that the steel industry almost entirely drew up its own code, Mr. Tower said he certainly would not subscribe to such a theory. He said a number of code provisions would have been different if members of the code had drawn them. Such provisions, he said, were drawn at the behest of the Administration.

At one point Senator Wheeler told Mr. Tower that the latter was head of the institute.



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"You are the institute," the Senator exclaimed, as he warmed up.

"I am not head of the institute and insist upon the record saying so," retorted Mr. Tower.

Mr. Tower made it clear that anything done under the code was done with the approval of the National Recovery Administration and that two of its members, Mr. Richberg and former Divisional Administrator K. M. Simpson were present at meetings of the Steel Code Authority and were acquainted with assessments of liquidated damages and all other activities of the code authority. When Senator Wheeler read a statement in the FTC basing point report that the Steel Code Authority declined to give the commission records of assessed liquidated damages, Mr. Tower replied that the code authority was acting under instructions of the NRA. He insisted that the performance of the code did not call for apology but rather was something which deserved praise.

After a further extended rehash of code operations by Senator Wheeler, Mr. Tower said he was "still puzzled why we sit here and discuss the administration of the code, details of agreements, etc., knowing all the time it was approved by the Administration." He said he thought he had been asked to discuss the basing point method of quoting prices.

When Senator Wheeler flared up about being "lectured" Mr. Tower replied he had not undertaken to lecture anyone but that he did want the record to be perfectly clear in

behalf of the steel industry as to the matters under discussion.

Senator Wheeler said that he "appreciated that the steel institute is very powerful and that you control the institute, which controls the economic life of the nation."

"The steel institute controls nothing and I want the record to show that fact," Mr. Tower emphatically replied.

At a later point Mr. Tower said he believed that the basing point system contributes greatly to competition in selling steel in the different markets. Senator Wheeler hauled out again his contention that agricultural products are not sold on such a system. Mr. Tower replied that there is no close parallel between agricultural and manufactured products, the latter being at the mercy of the elements once planting has been done. He said it is utterly impossible for the steel industry to operate except against orders, aside from the occasional factor of stocks. Therefore, he said, instead of supply being the determining factor, demand is the determining factor.

Senator Wheeler unconsciously provided humor for the small audience in the hearing room during the course of the testimony.

"There is a report that the steel people recently got together in New York and agreed to divide their markets," Senator Wheeler told Mr. Tower. He wanted to know if Mr. Tower had knowledge of such a meeting.

Mr. Tower assured the Senator he had no such knowledge.

"If there were such a move," said Mr. Tower, unable to restrain a smile, "and if such an agreement were entered into it wouldn't last any longer than it would take a man to get to the telephone."

Loud laughter came from the audience. Even Senator Wheeler enjoyed the sally and said he agreed with Mr. Tower.

Fallacies In Criticism of Basing Point System

In his prepared statement, Mr. Tower said opposition to the basing point system revolves around four alleged objections: That it is the means by which the industry collects a tribute in the form of unearned freight; that it is a device for fixing a uniform level of prices in the steel industry, thus destroying competition; that under it prices are held at rigid and artificially high levels and that it encourages wasteful cross hauling.

Mr. Tower attacked each objection as being fallacious and vigorously supported his declaration that the basing point method of quoting steel prices has proven "eminently satisfactory and fair to the mass of both buyers and sellers."

Regarding the first objection, he said it was disposed of by the recent testimony of Donald Richberg to the effect that investigations of NRA disclosed a large excess of freight charges in favor of customers under the basing point method. To the second charge, Mr. Tower replied that in no industry is there keener and more competition than in the steel industry and that this is a natural result of the basing point method. The third objection was met with the statement that "it seems ludicrous to suggest that any industry which had the power to fix prices * * * should have consistently sold its products at little or no profit." It was stated that in the steel industry earnings over the past decade have averaged 2.5 per cent on capitalization and during the four years of 1931-1934 large deficits were incurred. To the fourth charge, Mr. Tower answered that cross hauling is a subject about which there is little, if any, information and that elimination of cross hauling would be a serious blow to the railroads.

In discussing freight charges, Mr. Tower said that the cost of transportation influences prices in two ways.

"For sales in his own locality," he said, "a producer has an advantage over any competitor located elsewhere. For sales at a distance if a producer is at a disadvantage from the standpoint of freight he

must figure it into his cost of doing business if he wants to meet competition. For these reasons any producer who does other than a local business will find that his net return on sales varies with the place where the sale is made."

Brief description was given of the basing point method of quoting a "delivered" price. Mr. Tower explained that the "delivered" price is composed of the price at the basing point, which may or may not be the location of the seller's plant, plus freight charges from the basing point to the point of delivery.

"Basing points, with few exceptions, are places which are important centers of iron and steel production," said Mr. Tower. "These exceptions are certain Gulf and Pacific ports required as basing points because of the constant threat of low price foreign steel imports. In all there are more than 80 basing points for the steel industry.

"In quoting a price for his product the seller uses the basing point which will give the prospective customer the lowest 'delivered' price. As a result of that practice a producer, no matter where located, may sell his products in any part of the country in competition with all other producers.

"That is an advantage to the producer because it frees him from dependence upon local markets alone to absorb his products. He may reach out for markets anywhere in the country.

"It is an advantage to the buyer because he is not dependent on local steel producers either as to price, time of delivery, or quality of material. He may draw upon the entire country for supplies without penalty of price."

The basing point method was said to be no more a device for fixing prices than any other method of quoting prices. Under it, it was declared, a large number of producers are enabled to compete at a given point.

"The greater the number of sellers seeking orders in any consuming area, the greater the competition," said Mr. Tower. "Conversely, the fewer the number of sellers the less the competition is likely to be."

Steel Consumers Have Not Been Hampered

In attacking the contention that under the basing point method prices are held at rigid and artificially high levels, Mr. Tower said that certainly the level of steel prices has not hampered the amazing growth of such industries as automobile, electric refrigeration, washing machine, farm tractor, etc., whose success has depended

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It was stated that prices in the steel industry declined steadily from 1923 to 1933. The industry, it was pointed out, has made tremendous strides in improving the technique of production and the resulting savings in cost have been largely passed on to the public in the form of lower prices. During the past few years, for example, Mr. Tower said, steel companies have invested

over \$200,000,000 in new continuous strip mills, with the result that the product has been improved and the price cut almost in half.

"If it is the primary aim of the champions of the anti-basing point bill to bring about still lower prices for steel products, it is well that they face certain facts in the steel industry," Mr. Tower continued. "During the depression dividends practically disappeared. Taxes, railroad rates and raw material costs

must be met. The only remaining flexible item is that of wages, and it is only a question of time when wage rates would have to give way if prices were forced much lower.

"At the present time the industry, operating at 60 per cent of capacity, is employing about 450,000 persons, a figure approximating the total of 1928 and 1929, when operations were around 85 per cent of capacity. Wage rates have been increased 35 per cent since 1933 and are now at the highest level since 1929, and in some sections they exceed 1929."

Stating that cross hauling is a subject about which there is little, if any, information, Mr. Tower inquired if it is cross hauling if a man living near a shoe factory in Boston wants to buy a particular brand of shoes made in Chicago and vice versa. Steel, he pointed out, is shipped to all parts of the country to customers who, for reasons of their own, want particular grades from particular companies. He asked if they are to be denied that right.

Having in mind testimony of Dr. Frank A. Fetter, Mr. Tower said it had been suggested that cross hauling costs \$1,000,000,000 a year, "fully 25 per cent of the gross income of the railroads." Wipe this out, said Mr. Tower, and what would happen to railroad employment and freight rates?

Communities Dependent on Industrial Location

"For various reasons," said Mr. Tower, "many steel plants are located at some distance from chief consuming centers. This is particularly true of small producers. Likewise the plants of many users of steel are removed from steel centers. For example, in the Pittsburgh district, with a productive capacity of about 20,000,000 tons of steel annually, the local consumption does not exceed a minor fraction of that amount.

"In many parts of the country whole communities have been built up around steel mills and their existence depends upon the mills. The passage of legislation outlawing the basing point method and limiting the ability of individual steel mills to compete outside of their respective localities would write finis to the history of a great many steel communities and issue a blue slip and a final pay check to tens of thousands of workers in the steel mills.

"Those mills located close to advantageous markets would enjoy virtual monopolies. The building of new steel mills in these locations would be stimulated as the steel industry declined in other districts. Because of its heavy nature, a large



FRANK R. FROST

steel plant cannot economically be moved nor its major equipment shifted from one place to another. Consequently, the anti-basing point legislation imperils not only the jobs of workers, but the savings of thousands of investors.

"These are factors weighing most heavily against the anti-basing point bill, but there is another factor of great importance to steel buyers and sellers, particularly the smaller companies. That is the cost and difficulty of figuring hundreds of complicated freight rates to determine what competition is to be met, if the convenient yard stick of the basing point were to be discon-

Mr. Tower Does Not Share Senator Wheeler's Opinion of Trade Papers

SENATOR WHEELER has given his "expert" opinion as to how industrial journals obtain steel prices. In short, the Senator's view is that these prices are dictated by the steel industry.

Walter S. Tower, executive secretary of the American Iron and Steel Institute, expressed a contrary view when he was before the Senator's Committee on Interstate Commerce.

"I will say to you," said Mr. Tower, directing his remarks to Senator Wheeler, "that there are a large number of very able correspondents of trade papers, some of whom have been sitting here. And they have ways of getting at what the facts are in regard to prices going. And the prices to which they refer in their columns are not in any sense necessarily the prices which the producer would have reported if he could determine what the price is. If anybody would give him the power to fix the price it certainly would not be the price that the trade paper reports."

tinued. Big companies perhaps could employ sufficiently large staffs of traffic experts, but how small companies would solve the problem I do not know."

States Position of Small Mill

Frank R. Frost, president, Superior Steel Corp., Pittsburgh, maker of carbon and stainless strip steel, which employs 1100 to 1200 men in its plant at Carnegie, Pa., strongly objected to the Wheeler-Utterback bill when he appeared before the committee Monday morning. He spoke especially for the non-integrated companies, such as his own, which buys raw material in the form of billets, slabs and sheet bars, from the larger companies.

"In the absence of any uniform system of costs in the steel industry and with a tacit understanding as to the maintenance of a high wage level, it would appear that the result of a bill such as has been proposed here," said Mr. Frost, "would be disastrous to all small manufacturers having but one plant. They would find it very difficult to accommodate themselves over night to a system of selling that would provide for a basing point at every mill, and the net result would be spirally lower prices, lower wages and chaos in the industry.

"If any of the Senators were ever called upon to meet a payroll in the face of continued losses they would understand that the small steel manufacturers greatly desire a full knowledge as to exactly what their competition amounts to in a realized price at their mill, and this proposed bill makes it very difficult or impossible for them to get this knowledge."

Mr. Frost pointed out that his company serves approximately 700 customers whose plants are located in various sections of the country, reaching as far east as the New England states, but with a relatively small number in the Pittsburgh district. He stated that his company rolls special grades of steel in small quantity orders which are not produced economically in the larger mills, although these special grades of steel are essential to many consumers, including some of the largest buyers in the country. The company's customers, it was explained, are interested primarily in the cost of steel laid down at their plants. Whenever it becomes necessary for the company to meet competition of a mill located nearer to their plants than the Superior Steel Corp. is, Mr. Frost said, the matter of freight becomes an item of cost.

"With the present multiple basing point system, it is difficult

enough for us to determine our competition exactly, and to increase greatly these basing points, as the new f.o.b. system would certainly do, would so handicap small plants with no consuming nearby markets that they might be forced to run at a loss even in the face of a reasonable rate of operation," Mr. Frost said. "Therefore, please do not delude yourself that the passage of this bill is in the interest of small steel manufacturers. It is in the interest of no steel manufacturer as far as that is concerned, but would harm the small one greater than the large one, and in the end we believe it would be harmful to the public in that it would increase monopoly and be against the interests of a number of consumers.

"It would be far better to allow the industry gradually to take up the shock of absorbing the production from the new large continuous strip mills that have been built or are in the process of being built, determine their effect upon competition and the number of men that will be thrown out of their present employment, before adding drastically to the number of basing points now used by the industry which would certainly be against the interest of the small steel manufacturer not located in a consuming area, and might cause more unemployment in the industry."

Basing Points Provide Best Merchandizing Method

Robert Gregg, vice-president in charge of sales, United States Steel Corp., New York, told Chairman Wheeler that, in general, prices of the corporation subsidiaries are delivered prices quoted on basing points nearest to destination. Prices by truck at Pittsburgh, he stated, would be Pittsburgh prices plus a reasonable charge for loading. Mr. Gregg said he thought there is an allowance for truck delivery based on a percentage of the rail rate.

He said that the basing point method of quoting delivered prices is due primarily to the necessity of considering secondary markets at various places and that it has been found that this merchandizing method brings more stability to the secondary market than any other method.

Replying to a question by Senator Wheeler as to whether there is competition in the steel industry, Mr. Gregg said he thought the steel market is highly competitive. He stated that on the previous day a price was made on steel for delivery not far from Washington which had no relation to the basing point. The price, he said, was made by a southern producer. Mr. Gregg added that there have been a large number of cases during recent

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weeks of variations in prices from those quoted in trade papers.

Senator Wheeler called attention to the order of the Federal Trade Commission in July, 1924, requiring subsidiaries of the United States Steel Corp. to cease quoting Pittsburgh-plus and explained how that system has been expanded into a multiple basing point system. Trying to show that the order had not been obeyed, he inquired if corporation subsidiaries still quote Pittsburgh-plus basis. Mr. Gregg replied that the system is wholly dif-

ferent now and that Steel Corporation subsidiaries have abandoned the Pittsburgh-plus method of quoting and now quote on a multiple basing point system.

Senator Davis of Pennsylvania asked if the Steel Corporation had received any complaints to the effect that it was not obeying the F.T.C. order. Mr. Gregg said none had been made. He also said in a reply to a question by Senator Davis that reports that the steel industry makes more money from

(CONTINUED ON PAGE 90)



NEWS OF THE WEEK

Detroit Foundrymen Hear Sales Discussion

THERE is no use in making castings unless you can make them at a profit in the opinion of J. H. Redhead, president of Lake City Malleable Co., Cleveland, who spoke before the Detroit section of the American Foundrymen's Association on March 19. Mr. Redhead punctuated his talk with a series of questions which he directed to his audience. To whom, for example, are the foundry equipment manufacturers going to sell, if for every \$5 per ton they save a foundry on casting costs, the foundry hands \$20 a ton to the customer in the way of price concessions?

According to the speaker, castings have never been properly sold. They are not "merchandised" unless there is a profit to the company and a good living to the workers in the industry, a condition that does not now exist. Quality, delivery and service are merely stock words, and the first-named item particularly has never been properly sold. Quotations are often given without even seeing the pattern. Mr. Redhead thinks it is a mistake to quote a flat price on a miscellaneous lot of castings. In order to do a good job, every last scrap of information should be obtained about the pattern, and the manufacture of the pattern should preferably be under the control of the foundryman, rather than the purchaser of the finished casting. The use of complete specification blanks was suggested in order to get needed information to produce a quality casting.

Salesmanship calls for the highest form of intelligence and cannot be obtained without infinite pains and training. The salesman must know not only his own business, but the other fellow's as well and,

in addition, he must thoroughly understand human nature. To sell iron, a man must have iron in his system. This can only be attained by repeated refining, intense heat and hard knocks. The depression should have taught us one thing and that is how to develop better men. Mr. Redhead wondered how many companies had really benefited by the experiences of the depression to the extent that they are doing a better job technically, a better merchandising job and have developed better men than they had six years ago.

Predicts Large Gain In 1936 Construction

OPENING of the spring construction season has brought indications that industrial building in 1936 may exceed that of last year by as much as 75 per cent, according to George A. Bryant, Jr., executive vice-president and general manager, Austin Co., Cleveland.

"Early estimates of a 50 per cent increase have proved conservative by contracts already in hand and the increasing volume of inquiries from all parts of the country," Mr. Bryant stated. "At the present rate of sales our 1936 material purchases will cover requirements on industrial buildings costing in excess of \$10,000,000 and the equipment of these plants will probably involve other expenditures by the owners in excess of \$20,000,000. The effect has been not only to swell our organization's building material requirements to the highest level since 1930, but to place us in the market for direct purchases of improved construction equipment including welding machines, concrete mixers, compressors, vibrators and buggies, tractors, wood-working machinery and pumps."

Estimated material requirements for use by the Austin Co. in 1936 in construction material include in addition to various other building materials 20,000 tons of fabricated structural steel, 5000 tons of reinforcing steel, 3000 kegs miscellaneous bolts, 5000 kegs rivets, 4500 kegs of wire nails, 1500 coils annealed wire, 100 tons welding rod, 1250 tons pipe, 1,250,000 bbls. cement, 600,000 sq. ft. steel sash, 10,000 sq. ft. tin-clad, kalamein and steel type doors and trim, 15,000 sq. ft. overhead type doors, some with motor control, 150,000 sq. ft. metal deck, 150 tons porcelain enamel sheets, 150 tons patent level sheet and 4500 squares metal roofing. Equipment required in general contracts for these buildings will amount to \$1,500,000, which will include elevators, motors and electric control equipment, traveling cranes, air conditioning systems, boilers, sprinkling equipment, unit heaters, ornamental iron work, lift doors, stokers, etc.

"The steel industry," says Mr. Bryant, "through contributions of special alloy steels which lend themselves to enduring ornamental use in architecture and structural material possessing the qualities necessary for successful welding, has made one of the outstanding contributions to construction progress. It likewise can share the credit for perfection of porcelain enamel which is today transforming service stations throughout the country."

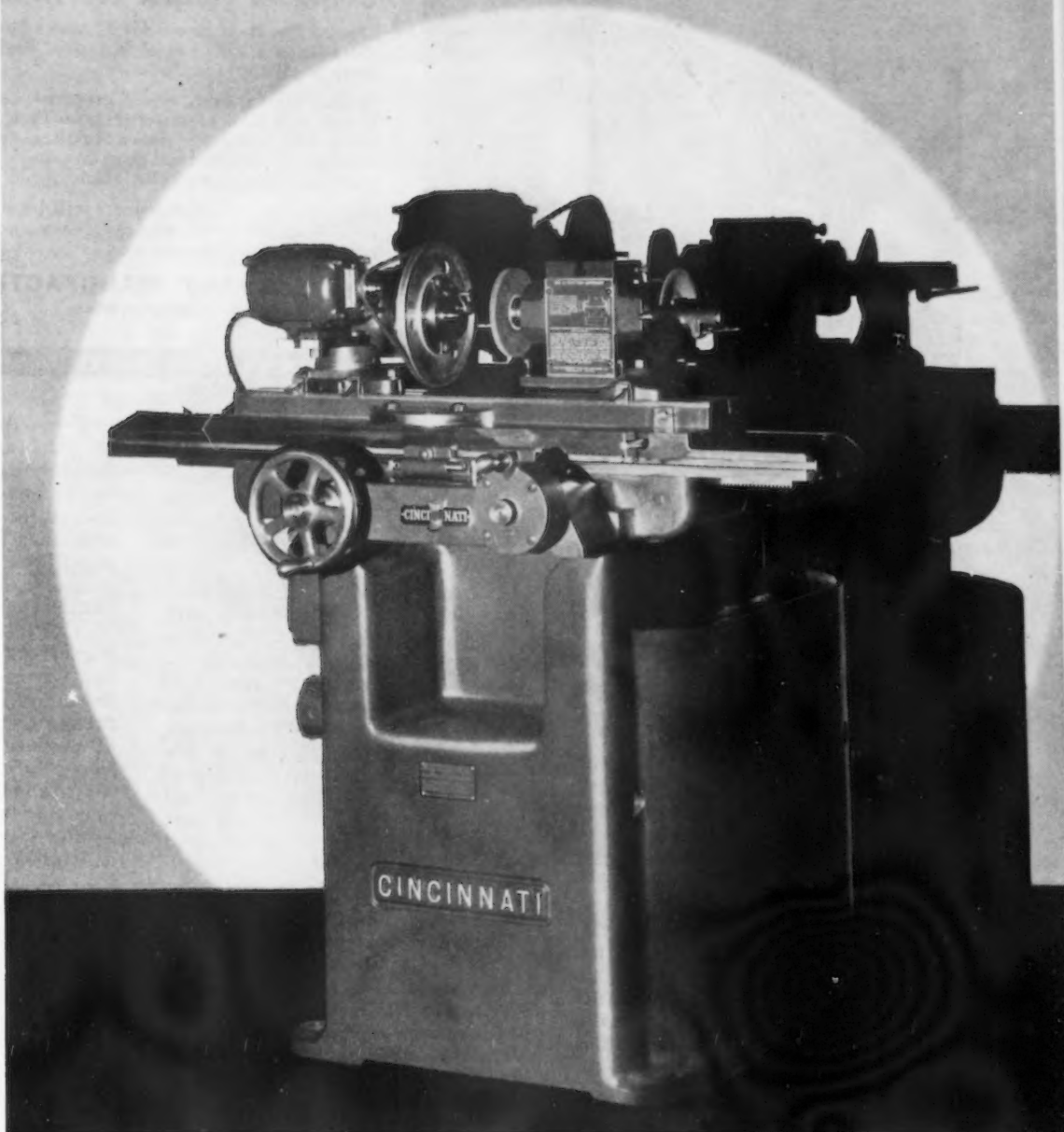
The Refrigerating Machinery Association will meet on May 14, 15 and 16 at Hot Springs, Va. On the final day of the convention the annual meeting of the Air Conditioning Manufacturers' Association will also be held. A broad program for the coming year will be discussed at this time.

THE CINCINNATI NO.2 CUTTER GRINDER

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Correctly sharpened tools, quickly available, are one of the basic requirements necessary to keep your machinery working in a lock-step pace with your production schedule. The Cincinnati No. 2 Cutter and Tool Sharpening Machine fulfills this requirement. Accurate cutting and clearance angles, the very essence of a free cutting tool, are quickly and easily obtained on this machine.

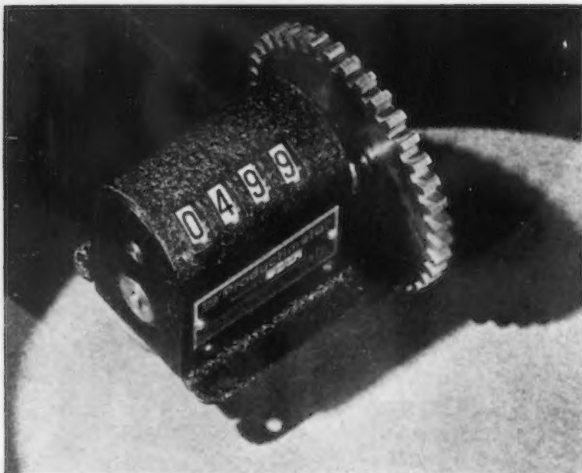
Your tool maintenance gang will like the Cincinnati Cutter Grinder, because it is so easy and convenient to operate. Improved controls and adjustments en-

able them to do many sharpening jobs 15 to 25% faster, and incidentally to quickly end the clamor of the machine set-up men when a sharp cutter is required in a hurry. Unusual flexibility permits a large variety of milling cutters, reamers, hobs, form tools, etc., to be easily and accurately ground.

May we suggest that you investigate the performance of the Cincinnati No. 2 Cutter and Tool Sharpening Machine? Write for the Facts on Features booklet M-647.

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THE SPEEDOMETERS OF INDUSTRY

Foote Brothers Effect Plant Consolidation

FOOTE BROTHERS GEAR & MACHINE CORPN. has taken over all activities and assets of Foote Brothers Gear & Machine Co., 5301 South Western Boulevard, Chicago, bringing to completion the reorganization and consolidation of activities which were started in August, 1932. From that time, until the completion of the reorganization, the new management effected many changes in the physical structure which have resulted in considerable reductions in operating costs.

The major move in this program was the consolidation of the two Chicago plants, then known as the Curtis Street and Plamondon plants. Obsolete equipment of both plants has been discarded and the balance from the Curtis plant moved to the Plamondon plant.

Manufacturing Leads In Absorbing Unemployed

MANUFACTURING has absorbed more unemployed workers during the past two years than any other branch of industrial activity, according to an analysis by the National Industrial Conference Board. Of the total reduction in unemployment between January, 1934, and January, 1936, 80.3 per cent is attributable to improved conditions in manufacturing industries.

Unemployment in non-manufacturing industries in the first month of 1934 constituted 66.6 per cent of the total estimated unemployment. Two years later it had increased to

71.2 per cent of the total. The situation outside of manufacturing, construction and mining, appears to have become worse rather than better.

Unemployment in manufacturing, according to the board's estimates, declined from 3,597,000 in January, 1934, to 2,824,000 in January, 1936, or approximately 22 per cent. The construction industry absorbed about 255,000 workers, representing a decline of 20 per cent in the number of unemployed in that field. Mining reemployed 26,000, or slightly over 5 per cent of its proportion of unemployed workers.

In the combined fields of trade, and transportation and communication, unemployment increased from 2,743,000 to 2,802,000 during the two-year period. These two groups accounted for 25.4 per cent of the total volume of unemployment in January, 1934, and 28.5 per cent in January, 1936.

Rackham Fund for Detroit Engineers

A SUBSTANTIAL endowment from the Horace H. and Mary A. Rackham Fund is expected to be made to support a newly formed united engineering group in Detroit, known as the Engineering Society of Detroit. An organization meeting composed of representatives of the principal chapter officers of the national societies as well as local groups took place March 17. At this meeting the purpose of the organization was outlined and an initial board of directors elected. Later, there is to be a board of five trustees named who will administer any funds or donations that the group may receive.

The new engineering society is to

be organized as a non-stock, non-profit corporation for educational and scientific purposes, under the provisions of Act 327 of the Michigan Public Acts of 1931. The chief purposes of the group will be educational and scientific, with the idea of uniting in an educational manner for the welfare of the public; increasing the personal efficiency of engineers and architects; promoting the general advancement of engineering and allied professions; providing library service, lectures, publications and instruction on technical subjects; promoting research and investigation of engineering problems of public interest; and encouraging and developing engineering education and the placement of young engineers. In this connection, plans are being formulated ultimately to establish permanent headquarters for meetings of officers and members of affiliated societies and for library service and lectures.

The present board of nine directors includes E. J. Burdick, consultant on securities and investments; W. D. Cameron, manager, Detroit office, General Electric Co.; Clair W. Ditchy, architect; Harold S. Ellington, construction engineer, Harley & Ellington, Inc.; Martin R. Fisher, assistant city engineer; John H. Hunt, director, New Devices Section, General Motors Corp.; James W. Parker, vice-president and chief engineer, Detroit Edison Co.; Clyde R. Patton, chief engineer, Packard Motor Car Co.; and David Segal, Detroit sales engineer, Eberbach & Son, Inc.

C. S. Roberts, formerly with Bethlehem Steel Corp. in Chicago, has opened his own sales agency to handle steel products and contractors equipment. The new organization will be known as C. S. Roberts Co., and will have headquarters in Chicago.

PERSONALS

WALLACE G. IMHOFF, president of the Wallace G. Imhoff Co., Vine-land, N. J., has been appointed technical director of research of the American Hot-Dip Galvanizers Association, Inc., Pittsburgh. He has been consultant to the hot-dip galvanizing and hot-dip tinning industries for the past 15 years. In 1920 Mr. Imhoff was technical director of research for the Metal Ware Association.

♦ ♦ ♦

JAMES M. DEGNAN, heretofore manager of the multi-V-drive and automotive divisions of the Worthington Pump & Machinery Corp., has been appointed general sales manager of the Hill Diesel Engine Co., Lansing, Mich., effective April 1.

♦ ♦ ♦

JOHN ROLFE, for the past several years identified with the publicity department of the Barber-Greene Co., Aurora, Ill., has been made sales promotion manager of the All-Steel-Equip Co., Aurora.

♦ ♦ ♦

WILLIAM R. BARCLAY, consulting metallurgist to the Mond Nickel Co., Ltd., has been elected president of the Institute of Metals, London, England. During the war Mr. Barclay was chief metallurgist to the non-ferrous rolled metal section of the Ministry of Munitions. In 1931 he was awarded the Thomas Turner Gold Medal by the University of Birmingham for distinguished services to industrial metallurgy.

♦ ♦ ♦

PAUL WATKINS has been elected vice-president and secretary of the Philadelphia Range Boiler & Tank Co., Philadelphia, succeeding WALTER PRICE, whose interest in the company has been purchased by IRA L. COUCH, president.

♦ ♦ ♦

ALBERT B. HOFFMAN, formerly chairman of the board of the Detroit Sulphite Pulp & Paper Co., has been made president and general manager of the Blackmer Rotary Pump Co., Grand Rapids, Mich. He is an engineer of wide experience in manufacturing, sales and business administration.

♦ ♦ ♦

DONALD P. HESS, who has been associated with the Timken Roller Bearing Co., Canton, Ohio, for the past 17 years, the last several of which as executive assistant to the president, has announced his resignation to take effect as soon as

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If you have not used them, send for free samples of **AMSCO Nickel-Manganese Steel Rod** or the **No. 459 Hard Facing Rod**. Description and Application details are available in **Bulletins No. 10 and No. 20**, sent you for the asking. Write today.

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ter April 1 as possible, so that he can devote his whole time to his new capacity of vice-president and director of the Ebco Mfg. Co., maker of plumbing fixtures, metal cabinets and partitions, of Columbus, in which he has recently purchased a substantial interest. He went with the Bearing company in 1919 as assistant factory manager of the main plant in Canton. In 1921, he was transferred to the Columbus, Ohio, plant, as general manager in charge of all operations, where he remained until 1927. He then returned to the main plant in Canton in his present capacity.

♦ ♦ ♦

E. T. BENNINGTON, formerly connected with the Cleveland Tramrail Co., has joined the Chicago office of the Harnischfeger Corp. as a sales engineer specializing in cranes and hoists.

♦ ♦ ♦

GEORGE L. ERWIN, JR., has resigned as sales manager of the Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines, to make new connections

early in April as an executive of a Chicago corporation, the identity of which will be announced later. He joined the Kearney & Trecker company in 1922 as a salesman, later being appointed advertising manager, and becoming sales manager in 1927.

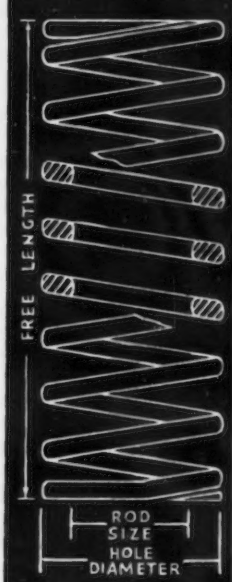
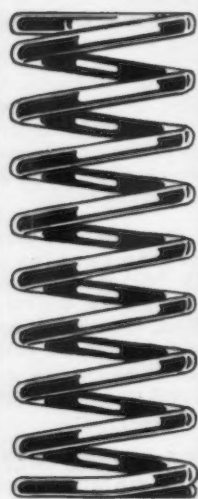
♦ ♦ ♦

LIEUT.-COL. HARRY M. TRIPPE, chief of the Milwaukee District, United States Engineers, will be retired in September after 30 years of service in the Corps. He is to be succeeded by LIEUT.-COL. WILLIAM H. HOLCOMBE, at present stationed at Fort Leavenworth, Kan. The Milwaukee office is headquarters for rivers and harbors development and maintenance along both shores of Lake Michigan.

♦ ♦ ♦

H. L. PIERSON, who was president of the Detroit Valve Motor Co. when it was purchased last year by the Eaton Mfg. Co., Cleveland, has been elected a director of the Eaton company succeeding CARLTON M. HIGBIE, who has retired to devote his time to other interests.

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OBITUARY

GEORGE GORDON CRAWFORD, for many years president of the Tennessee Coal, Iron & Railroad Co., and from 1930 to 1934 president of the Jones & Laughlin Steel Corp., died in Birmingham on March 20. He was born Aug. 24, 1869, in Madison, Ga., and was graduated from Georgia School of Technology in 1890. After two years of study at Karl-Eberhard University at Tübingen, Germany, he returned to this country and became assistant superintendent of the Edgar Thomson blast furnaces of the Carnegie Steel Co. From 1897 to 1899 he was superintendent of the blast furnace and steel works of the National Tube Co., at McKeesport and then superintendent of the Edgar Thomson furnaces for the next two years. He was manager of the tube works and plants of the National Tube Co., when he was transferred to Birmingham in 1907 as president of the Tennessee Coal, Iron & Railroad Co. He resigned to become president of the Jones & Laughlin Steel Corp. in 1930. Af-

ter his retirement in May, 1934, he devoted his time to personal affairs.

GEORGE E. MITTINGER, who served as general manager and vice-president of the former Amer-



G. G. CRAWFORD

ican Steel Container Co., Cleveland, died at his home in that city March 18, aged 66 years. He was superintendent of the New Castle (Pa.) Stamping & Enameling Co. from 1908 to 1912 and general manager and vice-president of the Petroleum Iron Works, Sharon, Pa., from 1912 to 1922. He was connected with the Cleveland company from the latter year to 1928.

RICHARD G. BLOTTER, assistant treasurer, National Tube Co., Pittsburgh, died suddenly on March 16, aged 44 years. He had held his position with the company since 1931.

RAYMOND DILL, treasurer of the Allis-Chalmers Mfg. Co., Milwaukee, died on March 17, aged 55 years. He was born in Ohio and after being graduated from the school of electrical engineering at Ohio State University in 1901, was connected with the Westinghouse Electric & Mfg. Co., Pittsburgh, until 1905, when he joined the engineering staff of the Bullock works of Allis-Chalmers at Cincinnati, later being transferred to the treasurer's department there. In 1908 he was appointed assistant treasurer at the main office in Milwaukee, and in 1923 he was promoted to treasurer of the corporation.

GEORGE JAMES, a director and factory superintendent of the James Mfg. Co., Fort Atkinson, Wis., manufacturer of steel farm structures and equipment, died on March 17, aged 63 years. He was born in Wales, Wis., March 17, 1873, and became associated with the James company in 1920.

HARRY SWINDLEHURST, president of Scott & Williams, Inc., died at the Parker House, Boston, on March 15. He had been associated with the concern since he was 12 years old, first at West Concord, Mass., from 1912 to 1916 at Laconia, N. H., and was then transferred to New York. He was 67 years old.

The Barnsdall Tripoli Corp., Seneca, Mo., has started production on a new American pumice which is similar to Italian pumice. An experimental washing and sizing plant has been built at the deposit near Grants, N. M., and is now in operation. An experimental grinding and sizing plant has also been built at Seneca, Mo. The material will be marketed under the trade name "Valencia Pumice."



WHAT CAN YOU DO WITH THIS?

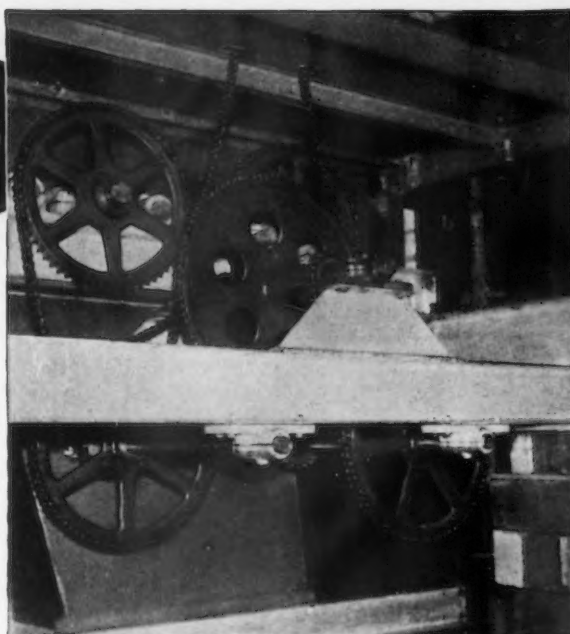
ASIDE from motor drives and machinery applications, plant men find numerous uses for Diamond Roller Chain.

In a prominent spark plug plant—213 feet of $\frac{1}{2}$ " pitch chain with attachment links are used for a conveyor drive . . . a rubber company has installed 960 feet of $1\frac{1}{4}$ " pitch chain with extended pins for a conveyor, and on some long 15 foot-center 90 H. P. drives, quadruple-strand $1\frac{1}{2}$ " pitch Diamond Roller Chain replaced another transmission.

In a large paper plant, a total of over 5 miles of Diamond Chain of various pitches, single and multiple-strand, have been installed during the past 10 years, $1\frac{1}{4}$ " pitch chains on paper-making machines where absolute synchronizing is essential— $1\frac{1}{2}$ " pitch single-strand on pulp washers.

In a textile bleachery, 1100 feet of 1" pitch Diamond with attachments at six-inch intervals were installed as part of a conveying unit.

In a textile mill, 32 lineshaft drives have been installed, and in its bleachery, the 58 Diamond Chain applications include from single to sextuple-



To dispose of bulky refuse, 5 Diamond Chain drives from one motor are arranged to operate screws of a conveyor to feed the refuse into top of an auxiliary furnace.

strand chains—for machine drives, lineshaft drives, fans, ceiling drives, calenders, tenters to dry cans, speed reducers to singers and cans, etc.

A sugar refinery uses $\frac{5}{8}$ " pitch chain 10 to 1 ratio on lowerator driven from $1\frac{1}{2}$ H. P., 500-1500 R. P. M. motor, and a 2" pitch chain from jackshaft to mingler for raw sugar . . . In fact, Diamond Roller Chain is put to work wherever

power is used, and many plants carry chains of various pitches in stock at all times. **DIAMOND CHAIN & MFG. CO., 433 Kentucky Ave., Indianapolis, Ind. Offices and Distributors in Principal Cities.**



DIAMOND ROLLER CHAIN

THE MOST VERSATILE POWER TRANSMISSION

Steel Industry Stages Quick Recovery From Floods

(CONTINUED FROM PAGE 67)

part of the city was facing a grave situation. Damage in the "Golden Triangle" ran into millions. Water in some of the downtown buildings reached a depth of 15 to 18 ft. while the conditions around the Point itself were indescribable. Thousands in various parts of the city were made homeless, water having completely ruined living quarters. The cessation of the main power plants in the city was a major catastrophe.

All offices in the city were without light, heat and elevator service except those having plants of their own and the latter were by far in the minority.

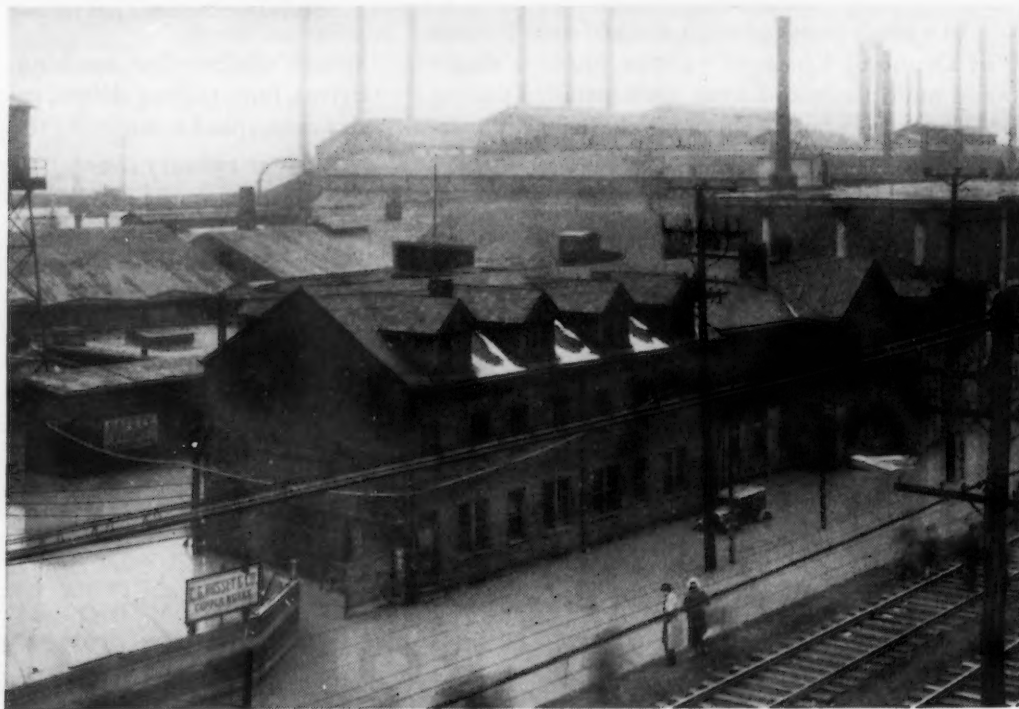
Office buildings were closed generally during Friday, Saturday and Sunday and with the beginning of the week rapid steps were made toward a resumption of normal activity. Pumping equipment, miniature light plants and machinery of all

kinds were rushed to the city by truck and available railroads and immediately pressed into service. Communications which were virtually paralyzed due to power failure were greatly extended by the end of the week. On Friday approximately 75 per cent of the area which had not been under water had telephone service. Giant gasoline charging machines were placed into service furnishing battery for



SCENES like this were common along the Allegheny and the Monongahela and Ohio rivers. In the distance can be seen the railroad approach to this mill, emerging from the water. At the height of the flood level the water found its way far above the place where the approach goes into the water in this picture.

WATER on this street at one time completely covered the car in picture. Some idea may be gained as to what problems faced manufacturing plants in this district before they were able to reach the activity prevalent today.



THIS district was badly hit. In the distance can be seen boats and men carrying on rehabilitation work. Today, one week later, mud and debris have been removed from this manufacturing plant and repairs to motors and machinery reached such a point that operations are proceeding forward at almost a pre-flood rate.



ALL coal shipments were at a complete standstill on three rivers. This picture shows a barge lashed to one of the Pittsburgh bridges. The approach in the foreground is a railroad ramp to lower tracks that are far under water. The coal barges are almost on the tracks.

telephone exchanges. Previous to a step-up in telephone service, those in charge of recovery operations depended on autos, messengers, and the few emergency lines in working order.

Fires Threatened

Fortunately no major fire hazards broke out although three serious fires occurred. The warehouse and office of one of the local steel companies was destroyed by fire with a loss of \$75,000. Militia patrolled the downtown streets where department stores suffered a terrific loss. Hundreds of cash registers, typewriters and billing machinery were damaged with mud and silt. Repairs were made on the

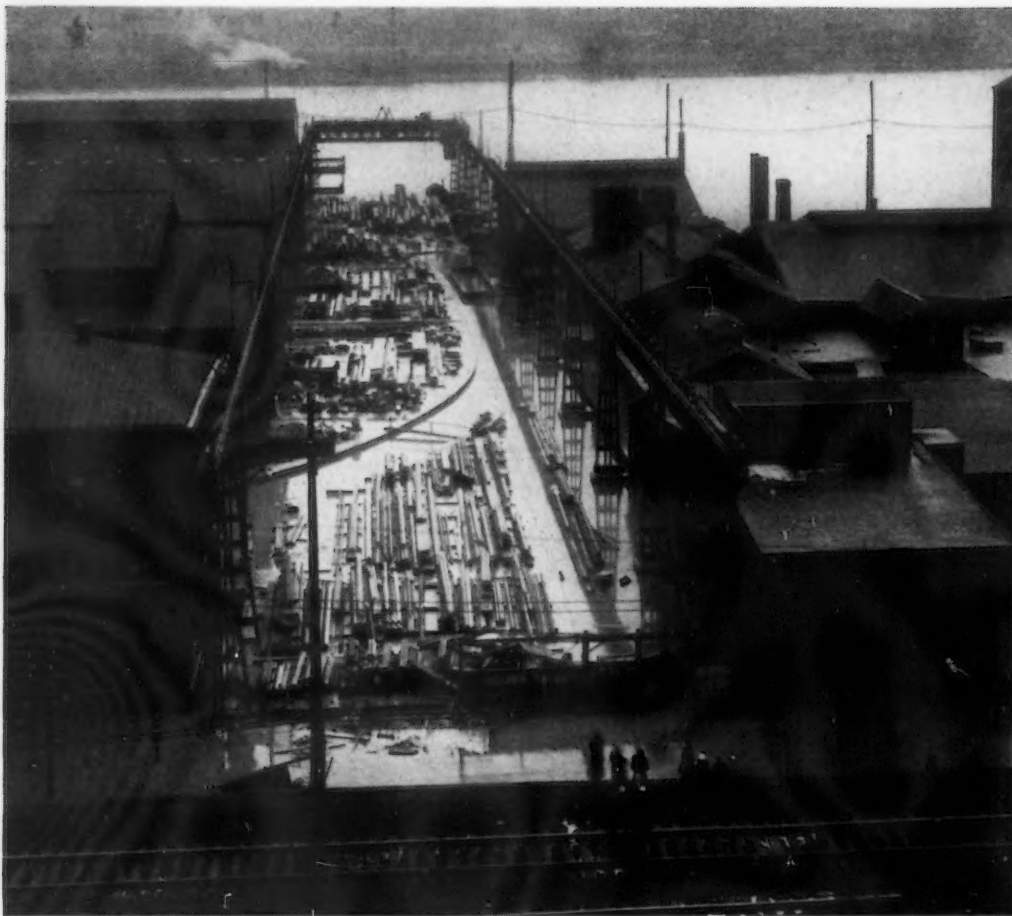
majority and the balance will be replaced. Damage to the downtown business section was appalling, however. One large department store was able to keep going on a restricted basis and many of the others whose first floors were under 4 to 8 ft. of water, reopened for emergency service as early as last Saturday.

As the last chapter in the flood catastrophe is being written it can be said that the people of the stricken area were free from hysteria and dug into the job on hand with results amazing to the outside world which was continually deluged with announcements of calamitous nature. There were few

signs of profiteering and on every hand people volunteered aid and companies more fortunate came forward with facilities and material for their neighbors who found themselves in serious predicaments.

Wheeling District Damaged

With the same spirit of recovery exemplified in the neighboring flooded territories, the Wheeling steel district pulled itself from conditions in many ways far worse than those occurring around Pittsburgh, and is today approaching normalcy at a rapid rate. One of the major producers in this district was able to operate shortly after high water receded. Equip-



o o o
TONS of steel stock were inundated in the district. At the crest every bit of steel in this picture was covered.
 o o o

ment at this plant had in many cases been removed to dry ground before the onslaught of the flood. Finishing mills at Steubenville, Ohio, were damaged to some extent by water but within a few days after the shut down preparations toward resumption of operations were completed and production of finished steel carried forward. The leading steel company in Wheeling suffered damage from water, the flood stage in that city having reached 55 ft. However, after performing actual miracles this mill was able to have its men report to work Monday and production has got under way.

Fairless Praises Employees' Efforts

B. F. Fairless, president, Carnegie-Illinois Steel Corpn., praised the work of his company's employees in the following statement:

"The rapid return to normalcy in our plants in this district following one of the most disastrous floods in history, is due to the loyalty and cooperation of our employees and management. Two of our plants were able to carry on throughout the flood, and the balance of our plants were in working

order within a day or two after the crest of the flood had been reached. Steel was being shipped from our yards last Friday, one day after the waters had reached their peak. At no time were orders refused or were such ideas entertained. Carnegie-Illinois Steel Corpn. has been and still is in position to satisfy the demands of its customers. While I am talking for our own corpora-

tion, I am sure I voice the sentiments of the majority of the steel people in the Pittsburgh district."

Bethlehem's Johnstown Damage Less Than Indicated

Bethlehem Steel Corpn. operations will be far less affected by flood conditions than is generally supposed. Even in Johnstown, where a heavy fall of snow handicapped the clean-up activities, operations are expected to reach normal again during the coming week. One reason for this was the policy of the company of anticipating and preventing damage to electrical mill equipment by hoisting it out of reach of flood waters when an inundation is indicated. This was done both at Johnstown and Harrisburg. Elsewhere plant locations were such as to make such precautions unnecessary.

Connecticut Valley Inundated

Hartford, Conn., March 24—All plants were closed with no power, lights or phones. Employees cannot get back and forth, because of lack of transportation. The river

"Business As Usual" With Machine Tool Sellers

PITTSBURGH district dealers in machine tools and machinery are doing business as usual this week. According to one leading seller, the fullest service is being rendered all customers, offices are fully staffed and telephone, telegraph and mail service is normal. While some office buildings are still handicapped, their tenants are carrying on business in the customary way.

at Hartford went over all river-front dykes. The Colt's Patent Firearms Mfg. Co., protected by a dyke built by Samuel Colt nearly 100 years ago was under water to the second story.

Plants in the Capitol Avenue section were closed because of power shortage, but escaped serious water damage, if any. Plants in East Hartford were closed but escaped water damage. East Hart-

ford is cut off from Hartford except by plane. By motor the nearest approach is via New Haven, a distance of 85 miles to make a two-mile destination.

New Britain was unaffected.

PRODUCTION OF PIG IRON AND FERROALLOYS IN THE UNITED STATES IN 1935 (Gross Tons)

(American Iron and Steel Institute)

All pig iron and ferroalloys are included, whether made in blast furnaces or in electric furnaces. Ferroalloys include ferro-manganese, spiegeleisen, ferro-silicon (containing 7 per cent and over of silicon), ferro-phosphorus, ferro-vanadium, ferro-chrome, etc.

PRODUCTION OF PIG IRON AND FERROALLOYS

(By States)					
Pig Iron:	1931	1932	1933	1934	1935
Pennsylvania	5,037,672	2,103,180	3,728,839	4,244,566	5,479,792
Ohio	4,120,610	2,387,028	3,918,723	4,207,944	5,634,530
Indiana, Mich.	2,327,839	1,034,801	1,469,783	2,184,546	2,898,478
Illinois	1,964,735	919,280	1,012,676	1,269,154	2,003,388
Alabama	1,640,851	652,898	900,170	1,171,650	1,297,960
Mass., New York	1,149,677	624,141	665,928	1,053,257	1,415,755
Md., Va., W. Va., Ky., Tenn.	1,419,987	680,774	1,143,600	1,318,964	1,781,171
Minn., Iowa, Col., Utah	296,408	147,562	161,000	226,808	269,686
Total	17,957,779	8,549,664	13,000,719	15,676,889	20,780,760
Ferroalloys:					
Pennsylvania	195,552	85,194	163,798	164,776	219,947
New York, N. J.	125,597	85,875	98,857	140,711	195,281
Ohio, Ill., Ia., Col.	89,352	41,510	63,386	116,402	113,147
Va., W. Va., Ala., Tenn.	58,074	19,210	18,842	39,795	63,564
Total	468,575	231,789	344,883	461,684	591,939
Grand total	18,426,354	8,781,453	13,345,602	16,138,573	21,372,699

PIG IRON MADE FOR SALE IN 1935 (By Grades and By States)

States	Bess. and Low-Phos.				Mal-leable	Forge	All Other	Total
	Basic	Phos.	Foun-dry					
New York....	123,469	42,218	265,662		238,449	....	1,684	671,482
Pennsylvania..	261,678	153,654	126,257		76,848	5,294	....	623,731
Md., Va., W. Va., Ky., Ala., Tenn....	57,062	26,080	655,595	....	....	....	21,785	760,522
Ohio	330,697	22,634	234,141		444,326	....	....	1,031,798
Ind., Illinois ..	109,297	7,683	22,154		258,508	....	....	397,642
Mich., Minn., Iowa, Colo., Utah	78	....	98,757		10,843	....	7,065	116,743
Total	882,281	252,269	1,402,566		1,028,974	5,294	30,534	3,601,918

HALF-YEARLY PRODUCTION OF PIG IRON AND FERROALLOYS

States	Blast Furnaces (a)				Production		
	In Blast		Dec. 31, 1935		First Six Months 1935	Second Six Months 1935	Total 1935
	June 30, 1935	In	Out	Total			
Mass.	0	0	1	1	614,576	801,179	1,415,755
New York	7	8	10	18	2,482,152	2,997,640	5,479,792
Pennsylvania	22	30	45	75	859,091	922,080	1,781,171
Maryland	3	4	2	6	648,405	649,555	1,297,960
Virginia	0	0	5	5	2,738,100	2,896,430	5,634,530
West Virginia	2	3	0	3	938,138	1,065,250	2,003,388
Kentucky	2	1	1	2	1,303,142	1,595,336	2,898,478
Tennessee	1	1	2	3	126,295	143,391	269,686
Alabama	7	11	10	21			
Ohio	25	27	23	50			
Illinois	8	10	15	25			
Indiana	6	10	8	18			
Michigan	6	7	0	7			
Minnesota	0	1	1	2			
Iowa	0	0	0	0			
Missouri	0	0	1	1			
Colorado	1	1	2	3			
Utah	1	1	0	1			
Total pig iron	*91	*115	*126	*241	9,709,899	11,070,861	20,780,760
Total ferroalloys	6	9	8	17	1257,790	1334,149	2591,939
Grand total	97	124	134	258	9,967,689	11,405,010	21,372,699

(a) Completed and rebuilding pig iron furnaces. *Furnaces making pig iron regularly. Furnaces making ferroalloys regularly not included. †Blast furnaces only. Electric furnaces not included. ‡Includes ferroalloys made in electric furnaces.

HALF-YEARLY PRODUCTION OF PIG IRON BY GRADES AND FERROALLOYS BY KINDS

BASIC PIG IRON

States	First Six Months 1935	Second Six Months 1935	Total 1935
New York	343,666	449,653	793,319
Pennsylvania	1,552,713	1,938,022	3,490,735
Maryland, West Va., Kentucky, Ala.	1,006,298	981,887	1,988,185
Ohio	1,785,299	1,673,601	3,458,900
Indiana, Illinois	1,393,998	1,664,915	3,058,913
Michigan, Colorado, Utah	388,248	440,153	828,401
Total	6,470,222	7,148,231	13,618,453

BESSEMER AND LOW-PHOSPHORUS PIG IRON

Pennsylvania	879,212	869,535	1,748,747
New York, Md., West Va., Alabama	229,100	209,452	438,552
Ohio	664,917	795,420	1,460,337
Indiana, Illinois	305,596	285,460	591,056
Total	2,078,825	2,159,867	4,238,692

FOUNDRY PIG IRON

New York	126,628	315,518	442,146
Pennsylvania	312,093	398,915	711,008
Md., Va., Ky., Tenn., Alabama	76,314	159,239	235,553
Illinois, Michigan, Colorado, Utah	93,151	163,394	256,545
Total	608,186	1,037,066	1,645,252

MALLEABLE PIG IRON

New York	152,087	163,747	315,834
Pennsylvania	207,372	262,678	470,050
Ohio	179,610	240,250	419,860
Indiana, Illinois, Minnesota	539,069	666,675	1,205,744
Total	539,069	666,675	1,205,744

FERROALLOYS BY KINDS

Ferromanganese and spiegeleisen	136,246	153,033	289,279
Ferrosilicon	102,639	160,223	262,862
Other ferroalloys	18,905	20,893	39,798
Total	257,790	334,149	591,939

PRODUCTION OF PIG IRON AND FERROALLOYS IN 1935

(For Sale and for Maker's Use)

Pig Iron:	For Sale		For Maker's Use	Total
	For Sale	For Sale	Use	
Basic	882,281	12,736,172	13,618,453	
Bessemer and low-phosphorus	252,269	3,986,423	4,238,692	
Foundry	1,402,566	242,586	1,645,252	
Malleable	1,028,974	176,770	1,205,744	
Forge or mill	5,294	31	5,325	
White and mottled, direct castings, etc.	30,534	36,760	67,294	
Total	3,601,918	17,178,842	20,780,760	
Ferroalloys:				
Ferromanganese and spiegel	124,566	164,713	289,279	
Ferrosilicon	256,217	6,645	262,862	
Other ferroalloys	39,262	536	39,798	
Total	420,045	171,894	591,939	
Grand total	4,021,963	17,350,736	21,372,699	



Unfavorable operating conditions only serve to emphasize the advantages of Baldwin-Duckworth Roller Chains.

The drives here illustrated, for example, are almost buried in sawdust and waste, yet they convey lumber away from the saw month after month with unimpaired efficiency and without special attention.

If there is a conveyor job in your plant that has to face severe conditions of any sort you will find Baldwin-Duckworth precision machined Roller Chain and Baldwin Accurate Cut Sprockets will give you smooth and uninterrupted operation. Our engineers will advise—free—on proper selection and installation. **BALDWIN-DUCKWORTH CHAIN CORPORATION, SPRINGFIELD, MASS.**

BALDWIN-DUCKWORTH

(CONTINUED FROM PAGE 79)
freight rates than profits on steel is "far from the truth."

"As a matter of fact," said Mr. Gregg, "I would say the steel industry pays more freight than it gets back under its method of merchandizing."

Referring to testimony of Dr. Frank A. Fetter regarding large financial wastes in freight cross hauling, Mr. Gregg said he understood Dr. Fetter said that such alleged waste on cross hauling cement was \$42,000,000 a year. He then pointed out that in 1934 the entire freight charge for hauling cement was only \$31,000,000.

Harold I. Ickes, Secretary of the Interior and Public Works Administrator, told the committee of identical bids received by bureaus

of the Interior Department and the PWA on steel, cement and many other requirements. When asked by Senator Minton, Democrat, Indiana, if he had determined whether the situation was due to the basing point system, Mr. Ickes said it is his opinion that "it is due to that system, especially as to steel and cement."

"Could you reasonably assume it is due to collusion?" inquired Senator Minton.

"Well, it is the same thing, isn't it?" replied Mr. Ickes.

The Secretary of the Interior said that between June, 1935, and March, 1936, identical bids were made at least 257 times and involved gross expenditures of \$2,866,252.

Commenting on the experience of

the Reclamation Service, Interior Department, with particular reference to identical bids received on cement, steel and insulated wire and cable, Mr. Ickes said that the persistent submission by manufacturers and vendors of identical proposals has made it practically impossible for the Government to comply with the section of the law providing that awards must be made on the basis of competitive bids. He mentioned an instance when 26 bids were opened in the Denver office of the Bureau of Reclamation on Jan. 31, 1936, on insulated cable for the Boulder canyon project. He said that although shipping points were widely scattered, the bids were identical.

It was declared that as a result of identical bids the work of the bureau has been seriously hampered. The bureau, he stated, is "acting as a trustee in building irrigation works for the farmers, who will pay the cost of construction in the end. They are able to meet their payments only by great industry and self-denial and if costs go beyond a certain point, it will become necessary to give up the building of such projects. If all prices are identical, we might as well bargain with a single firm."

Scrap Industry Objects to Section of Bill

Section 29 of the Wheeler-Utterback bill, making it unlawful to quote delivered prices without stating freight costs, brought a protest from Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel. Mr. Schwartz said he thought the section would disrupt the efficient marketing machinery of the scrap industry and work to the disadvantage of a national policy of conservation in raw materials.

He explained the method scrap dealers employ in accumulating scrap and said he believed the section would prevent dealers from taking orders except for tonnages in their yards. These tonnages, he stated, are simply backlogs, and dealers can know only what prices will be from their yards. Not knowing the other sources of supplies that will have to be drawn upon to get scrap, it was stated, dealers cannot know what the freight charges will be from these sources. Saying that Section 29 is intended to correct certain abuses, Mr. Schwartz declared that the scrap dealer is the "bystander getting a dart in the head."

Senator Wheeler was sympathetic toward Mr. Schwartz's suggestion and said that the section might be amended.

Floods Influence Lower Capital Goods Index

FLOOD conditions in certain of the heavy steel producing centers were an important factor in lowering the index number for last week. THE IRON AGE capital goods activity index dropped from 75.7 to 73.4 per cent of "normal," a loss of slightly more than 3 per cent from two weeks ago. The index figure for last week, however, is necessarily provisional, as it is too early at this point to estimate accurately the extent of industrial operating losses sustained in certain inundated areas. Steel ingot output was noticeably affected, but volume of motor cars produced, as calculated by Cram's Reports, Inc., showed a nominal increase during

The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 = 100)

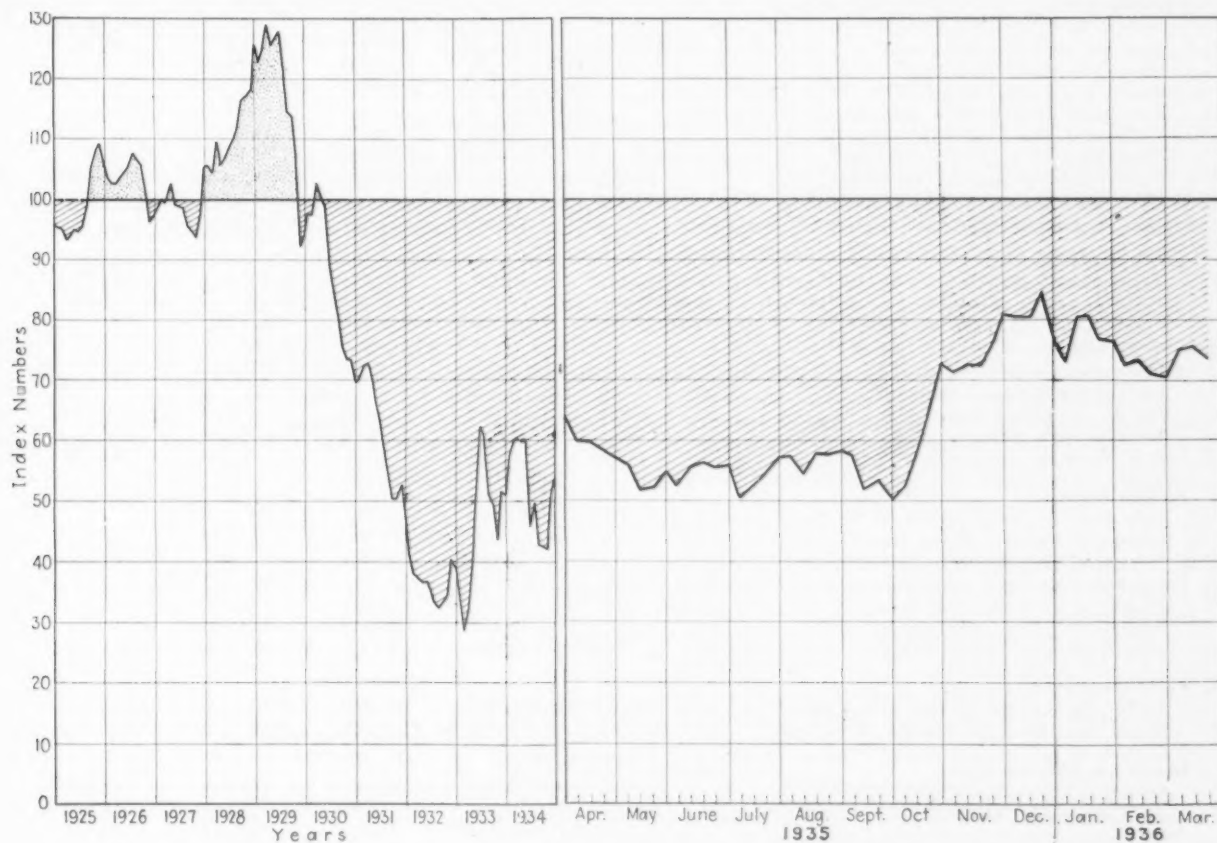
Last week (provisional)	73.4
Preceding week	75.7
Same week last month	73.4
Same week 1935	60.6
Same week 1934	60.6
Same week 1933	27.9
Same week 1932	37.5
Same week 1931	72.9
Same week 1930	98.9
Same week 1929	124.9

the past week. Heavy engineering work in progress tapered off considerably.

The combined index, at 73.4 per cent of "normal," is identical with its level a month ago, but despite its lower standing is approximately 21 per cent above the comparable figure for 1935 and 1934.

Among the index's components, all of which are adjusted for usual seasonal change, the following variations were indicated:

Steel ingot output ... (down) 3.1
Automobile production .. (up) 1.3
Lumber shipments (up) 0.2
Pittsburgh industrial activity (down) 0.5
Heavy construction ... (down) 7.2



(1925-27 Average = 100)

THE Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Cram's Automotive Reports; heavy construction contract awards, from Engineering News Record; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	February, 1936	January, 1936	February, 1935	Two Months 1935	Two Months 1936
Raw Materials:					
Lake ore consumption (gross tons) ^a	2,632,306	2,951,568	2,467,269	4,747,662	5,583,874
Coke production (net tons) ^b.....	.....	3,450,342	2,873,432	5,762,984	.....
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	1,827,972	2,025,885	1,608,552	3,085,888	3,853,857
Pig iron output—daily (gross tons) ^c	63,034	65,351	57,448	52,303	64,231
Castings:					
Malleable castings—production (net tons) ^d...	.....	48,414	41,377	84,777	.....
Malleable castings—orders (net tons) ^d.....	.....	44,116	41,225	85,793	.....
Steel castings—production (net tons) ^d.....	.....	.....	31,725	64,074	.....
Steel castings—orders (net tons) ^d.....	.....	.....	29,687	58,722	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ...	2,967,803	3,049,439	2,777,765	5,649,296	6,017,242
Steel ingot production—daily (gross tons) ^e ...	118,712	112,942	115,740	110,771	115,716
Steel ingot production—per cent of capacity ^e ...	54.09	*51.46	52.28	50.04	52.7
Employment in Steel Industry:					
Total employees ^g.....	.....	.....	420,397	413,734	.....
Total payrolls (thousands of dollars) ^g.....	.....	.....	\$44,213	\$88,541	.....
Average hours worked per week ^g.....	.....	.....	35.6	34.6	.....
Finished Steel:					
Trackwork shipments (net tons) ^h	4,116	3,366	2,892	5,225	7,482
Steel rail orders (gross tons) ^c	147,450	214,541	80,174	131,174	361,991
Sheet steel sales (net tons) ⁱ.....	.....	174,805	183,322	505,153	.....
Sheet steel production (net tons) ^j.....	.....	223,000	219,062	454,776	.....
Fabricated shape orders (net tons) ^k.....	.....	117,218	75,841	140,147	.....
Fabricated shape shipments (net tons) ^k.....	.....	73,710	68,527	158,154	.....
Fabricated plate orders (net tons) ^k.....	.....	38,709	15,064	33,842	.....
Reinforcing bar awards (net tons) ^k	23,830	67,810	22,265	40,015	91,640
U. S. Steel Corp'n. shipments (tons) ^l	676,315	721,414	583,137	1,117,192	1,397,729
Ohio River steel shipments (net tons) ^l.....	.....	65,760	64,369	117,025	.....
Fabricated Products:					
Automobile production, U. S. and Canada ^m ...	304,232	380,554	353,781	657,173	684,786
Construction contracts, 37 Eastern States ⁿ ...	\$142,050,200	\$204,792,800	\$75,047,100	\$174,821,000	\$346,843,000
Steel barrel shipments (number) ^o.....	.....	535,370	402,928	841,262	.....
Steel furniture shipments (dollars) ^o.....	.....	.....	\$1,064,219	\$2,203,716	.....
Steel boiler orders (sq. ft.) ^a.....	.....	623,426	283,726	675,510	.....
Locomotive orders (number) ^m	46	14	1	1	60
Freight car orders (number) ^m	7,236	1,050	806	830	8,280
Machine tool index ⁿ	112.1	110.8	53.0	†6.15	.....
Foundry equipment index ^o	110.4	127.0	75.7	†76.4	†118.5
Foreign Trade:					
Total iron and steel imports (gross tons) ^p.....	.....	50,489	28,905	51,689	.....
Imports of pig iron (gross tons) ^p.....	.....	15,033	10,741	12,774	.....
Imports of all rolled steel (gross tons) ^p.....	.....	22,958	12,443	27,497	.....
Total iron and steel exports (gross tons) ^p.....	.....	241,564	228,537	491,277	.....
Exports of all rolled steel (gross tons) ^p.....	.....	79,100	67,329	140,725	.....
Exports of finished steel (gross tons) ^p.....	.....	74,254	59,147	125,670	.....
Exports of scrap (gross tons) ^p.....	.....	153,906	151,720	331,350	.....
British Production:					
British pig iron production (gross tons) ^r	584,700	595,500	483,100	1,004,300	1,180,600
British steel ingot production (gross tons) ^r ...	938,500	912,500	769,500	1,527,300	1,851,000
Non-Ferrous Metals:					
Lead production (net tons) ^s	34,127	36,296	27,495	56,809	70,423
Lead shipments (net tons) ^s	33,086	34,590	32,523	66,218	67,676
Zinc production (net tons) ^t	36,228	*41,917	33,468	68,603	78,145
Zinc shipments (net tons) ^t	39,918	46,468	34,877	70,332	86,386
Deliveries of tin (gross tons) ^v	5,600	6,635	3,905	8,505	12,235

†Three months' average. *Revised.

Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp'n.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; ^k F. W. Dodge Corp'n.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Rehabilitation of Flooded Steel Plants Is Going Forward Rapidly

Ingot Production Rebounds to 58 Per Cent of Capacity Following Drop to 54 Per Cent Last Week—Steel Deliveries Now Almost Normal

OPERATIONS in steel plants damaged by last week's disastrous floods have been resumed with phenomenal speed. Blast furnace activity was hampered only slightly and then largely because of interrupted transportation services. A few open-hearth plants in the seriously-affected Pittsburgh, Wheeling and Johnstown districts were flooded, but only in isolated instances will output be curtailed for longer than a few days.

Production of steel ingots last week was forced down to 54 per cent of capacity, a seven-point decline from scheduled output of 61 per cent, but more than half this loss will be regained this week when operations will average 58 per cent of capacity. This is one point higher than the rate a fortnight ago and it is now indicated that production next week will top the high output prior to the floods.

STEEL production at Pittsburgh this week is at 42 per cent, compared with a scheduled rate last week of 46 per cent and a performance of better than 28 per cent. After three days of 80 per cent operations last week Wheeling district output fell to 58 per cent and is now only one point higher. Philadelphia district production has been reduced two points to 40 per cent by the closing of a small open-hearth plant.

Ingot schedules are higher in the Chicago, Cleveland and Valley districts, but not because of the diversion of tonnage from the flooded territory. Generally speaking, only minor transferring of orders to unaffected mills has been reported, as finishing units in the Cleveland, Buffalo and Valley territories are being pressed to complete first quarter contracts which they already had. In some instances, mills in the flooded areas will be forced to delay shipment of some of the tonnage on their books until the first week of April or later.

WHEN the effects of the floods can be more clearly determined, the extent of the financial loss to steel companies can be more accurately estimated. At present all efforts are being concentrated on the resumption of normal service to consumers. This has already been accomplished to a large extent, as practically all mills were able to continue shipments by the time transportation facilities were again restored to normal.

Demand for many forms of steel this week is being

handled out of warehouses and shipments from mills will again be under way long before warehouse stocks reach an uncomfortably low point. However, the requirements of the construction industry are increasing rapidly and flood rehabilitation throughout the East and Middle West will unquestionably call for large tonnages of structural steel, piling, reinforcing bars and pipe.

AWARDS of construction steel thus far in the year have amounted to 478,947 tons, compared with only 332,971 tons in the corresponding 1935 period. It is significant also that private projects have accounted for a much larger percentage of this total than was the case last year. Fabricated structural steel lettings this week amount to 15,150 tons, compared with 31,750 tons in the previous week. New projects of 12,200 tons are lower than the preceding period's 19,525 tons.

The Panhandle Eastern Pipe Line Co. has placed 44,000 tons of 22-in. seamless pipe with the National Tube Co. This is the largest pipe tonnage reported in five years and will be required for a 235-mile line from Zionsville, Ind., to Detroit. Japanese interests have purchased 25,000 tons of sheet bars for the production of tin plate in that country.

RECENTLY announced second quarter prices, with quantity differentials applying on bars, sheets and strip steel, have not yet been given an adequate test. Consumers are showing little interest in their forward requirements and are much more concerned with rounding out their present stocks at shaded prices which prevailed until recently. However, little or no business is now being taken on these terms.

An important result of the quantity differential system will be a policy of consumers to concentrate their business with one or two mills. This tendency is already apparent and steel sellers are concentrating their sales effort on quality and service in order to secure the larger orders which will enable consumers to take advantage of maximum quantity deductions.

Sellers of iron ore, in quoting on the Ford Motor Co. inquiry for 490,000 tons, have indicated that last year's prices will be reaffirmed. THE IRON AGE composite prices of pig iron and scrap are unchanged at \$18.84 and \$14.75 a gross ton respectively, while the finished steel price index is holding at 2.084c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Mar. 24, 1936	Mar. 17, 1936	Feb. 25, 1936	Mar. 26, 1935
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$21.3132	\$21.3132	\$21.3132	\$20.26
No. 2, Valley furnace.....	19.50	19.50	19.50	18.50
No. 2, Southern, Cin'ti.....	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham†.....	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*.....	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.....	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace.....	19.00	19.00	19.00	18.00
Malleable, Chicago*.....	19.50	19.50	19.50	18.50
Malleable, Valley.....	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago.....	25.2528	25.2528	25.2528	24.04
Ferromanganese, seab'd car- lots	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh.....	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh..	28.00	28.00	29.00	27.00
Sheet bars, Pittsburgh.....	28.00	28.00	30.00	28.00
Slabs, Pittsburgh	28.00	28.00	29.00	27.00
Forging billets, Pittsburgh..	35.00	35.00	35.00	32.00
Wire rods, Nos. 4 and 5, P'gh	38.00	38.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.80	1.80	1.80	1.70

Finished Steel

<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.85	1.80
Bars, Chicago.....	1.90	1.90	1.90	1.85
Bars, Cleveland.....	1.90	1.90	1.90	1.85
Bars, New York.....	2.20	2.20	2.20	2.13
Plates, Pittsburgh.....	1.80	1.80	1.80	1.80
Plates, Chicago.....	1.85	1.85	1.85	1.85
Plates, New York.....	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago..	1.85	1.85	1.85	1.85
Structural shapes, New York.	2.06 1/4	2.06 1/4	2.06 1/4	2.05 1/4
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh.	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh.	2.60	2.60	2.60	2.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Finished Steel

	Mar. 24, 1936	Mar. 17, 1936	Feb. 25, 1936	Mar. 26, 1935
<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh...	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary..	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh.....	2.10	2.10	2.10	2.60
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.65
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	2.50	2.50	2.50	3.00
Barbed wire, galv., Chicago dist. mill.....	2.55	2.55	2.55	3.05
Tin plate, 100 lb. box, P'gh..	\$5.25	\$5.25	\$5.25	\$5.25

Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh....	\$15.75	\$15.75	\$15.75	\$11.75
Heavy melting steel, Phila....	13.75	13.75	13.75	10.25
Heavy melting steel, Ch'go....	14.75	14.75	14.75	10.25
Carwheels, Chicago.....	14.00	14.00	14.00	10.50
Carwheels, Philadelphia.....	14.75	14.75	14.75	11.75
No. 1 cast, Pittsburgh.....	15.25	15.25	14.25	12.25
No. 1 cast, Philadelphia.....	14.25	14.25	13.75	11.00
No. 1 cast, Ch'go (net ton)..	13.00	13.00	13.50	9.00
No. 1 RR. wrot., Phila.....	13.25	13.25	13.25	10.75
No. 1 RR. wrot., Ch'go (net)..	13.25	13.25	13.25	8.00

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$3.65	\$3.65	\$3.65	\$3.85
Foundry coke, prompt.....	4.25	4.25	4.25	4.60

Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	9.25	9.25	9.25	8.75
Lake copper, New York.....	9.37 1/2	9.37 1/2	9.37 1/2	9.12 1/2
Tin (Straits), New York....	47.75	48.30	47.62 1/2	47.45
Zinc, East St. Louis.....	4.90	4.90	4.90	3.90
Zinc, New York.....	5.27 1/2	5.27 1/2	5.27 1/2	4.25
Lead, St. Louis.....	4.45	4.45	4.35	3.45
Lead, New York.....	4.60	4.60	4.50	3.60
Antimony (Asiatic), N. Y....	13.50	13.50	13.25	14.50

The Iron Age Composite Prices

Finished Steel

March 24, 1936	2.084c. a Lb.
One week ago	2.084c.
One month ago	2.109c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

	HIGH	LOW
1936	2.130c., Jan. 7	2.084c., Mar. 10
1935	2.130c., Oct. 1	2.124c., Jan. 8
1934	2.199c., April 24	2.008c., Jan. 2
1933	2.015c., Oct. 3	1.867c., April 18
1932	1.977c., Oct. 4	1.926c., Feb. 2
1931	2.037c., Jan. 13	1.945c., Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29
1928	2.286c., Dec. 11	2.217c., July 17
1927	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$18.84 a Gross Ton
18.84
18.84
17.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
18.84, Jan. 7	18.84, Jan. 7	17.90, May 14
17.90, Nov. 5	17.83, May 14	16.90, Jan. 27
16.90, May 1	16.90, Jan. 27	13.56, Jan. 3
16.90, Dec. 5	13.56, Jan. 3	14.81, Jan. 5
14.81, Jan. 5	13.56, Dec. 6	15.90, Jan. 6
15.90, Jan. 6	14.79, Dec. 15	18.21, Jan. 7
18.21, Jan. 7	15.90, Dec. 16	18.71, May 14
18.71, May 14	18.21, Dec. 17	18.59, Nov. 27
18.59, Nov. 27	17.04, July 24	19.71, Jan. 4
19.71, Jan. 4	17.54, Nov. 1	

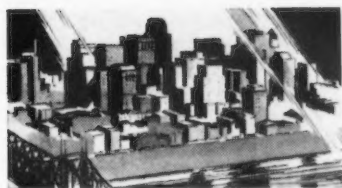
Steel Scrap

\$14.75 a Gross Ton
14.75
14.75
10.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
14.75, Feb. 25	14.75, Feb. 25	13.33, Jan. 7
13.42, Dec. 10	13.42, Dec. 10	10.33, April 23
13.00, Mar. 13	13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	17.58, Jan. 29	14.08, Dec. 3
16.50, Dec. 31	16.50, Dec. 31	13.08, July 2
15.25, Jan. 11	15.25, Jan. 11	13.08, Nov. 22

Steel Output Regains Most Of Loss at Pittsburgh



Production at Wheeling Still Curtailed—Finished Products Moving Again From Majority of Flooded Plants

PITTSBURGH, March 24.—Operations in the Pittsburgh district before the flood were at 46 per cent. However, due to curtailment of ingot production, when waters reached some open-hearths in this district, a sharp drop occurred from Tuesday night on. Since leading interests in this district were able to go through with partial production, operations for the week on a revised basis averaged 28 to 30 per cent of rated capacity. A rapid return to a normal state is responsible for an ingot output in the district this week of approximately 42 per cent of capacity.

Operations in the Wheeling district, after starting last week at 80 per cent, were curtailed by the flood to such an extent that the revised figure shows approximately 58 per cent of capacity. One of the large producers in the district was able to maintain ingot production practically at capacity throughout the flood. Ingot output in the Wheeling district this week will be at about 59 per cent of capacity.

Finished steel demand is in steady volume. With the majority of steel works in this district back to normal, movement of steel is increasing day by day. While the production of strip was not curtailed, shipments of this material were held up due to the crippling of transportation facilities. However, material is now moving forward at an increasingly rapid rate. Sheet mill operations were affected to some extent by the flood waters. However, large stocks were on hand which enabled producers to take care of current orders.

On the whole, tin plate production suffered very little last week, and a good volume of orders is coming in, while movement of tonnages out of the mills has approached a satisfactory rate. Consumers will not suffer much delay due to rapid reconditioning of material and the fact that large stocks of undamaged tin plate were on hand ready for shipment.

Specifications for heavy material are being received in satisfactory

amount and producers here are optimistic over the future outlook for this type of tonnage. Local interests last week received a large order for cold-finished stock from a leading implement maker.

Pig Iron

The large merchant producer in this district, although affected to some extent by flood waters, had its blast furnace in operation by Saturday night. Production this week will continue at capacity in order to move tonnage held up by the short shutdown and lack of transportation facilities. New specifications continue on a hand-to-mouth basis.

Reinforcing Steel

Quotations for second quarter have not as yet been announced, although they are expected in the near future. Specifications continue in fair volume, with miscellaneous bookings showing a sizable expansion.

Semi-Finished Steel

Specifications for semi-finished steel continue in good volume, and shipments are being rushed to non-integrated mills in order that they may complete orders covered by first quarter quotations. The firming of prices for the second quarter seems to have the approval of the trade. While shipments were held up last week due to flood conditions, some movement took place one or two days after the water had reached its peak and a gradual increase in transportation facilities occurred to such an extent that carloads were moving rather freely by Tuesday.

Strip Steel

The leading strip interests in this district, while unaffected by flood waters, were shut down only a few days due to failure of power and gas. However, shipments from these plants were moving forward as early as last Friday, and on Monday movement was rapidly approaching normal. Specifications

for strip continue in increasing volume, due in the main to the attempt of consumers to get first quarter delivery before firming of prices sets in. At the beginning of last week production of hot-rolled strip was at about 60 per cent of capacity. In the middle of the week, due to flood conditions, this figure was probably lowered 15 to 20 points. Operations at the beginning of this week were rapidly returning to normal, and by Wednesday the rate will be closed to 55 per cent. While it is possible that the deadline for shipments will be extended, mills in this district at this time have no intention of changing the established practice, regardless of the flood.

Bolts, Nuts and Rivets

Specifications against first quarter commitments are still moving from the district, and there has been a noticeable increase to the automotive trade and to jobbers' stocks. Orders from car builders continue in fair volume. One of the large local manufacturers, while damaged to some extent by high waters, fortunately had large stocks above the water level. Other plants which suffered damage by water rapidly reconditioned material subjected to the flood. Shipments are now going forward after a temporary setback.

Bars

There has been a further increase in the volume of orders from the automotive industry. Miscellaneous business also continues to be an encouraging feature of the local picture. While production in this market was curtailed last week, resumption of operations in many of the afflicted plants took place by last Saturday and movement of material from stocks unaffected occurred during the latter part of last week. There is a satisfactory volume of business from implement makers.

Cold-Finished Bars

Orders from automobile manufacturers continue to show improvement over last week, and as a result the market for cold finished bars is optimistic. A substantial tonnage has been released for immediate shipment to a large implement maker. Production of cold finished material by the largest interest in this district continued throughout flood conditions, as its plants were unaffected by high water. The main obstacle during this time was the absence of transportation facilities. However, this was partially cleared up and the movement of steel began the latter part of last week. Several non-integrated mills in this district, although affected by flood waters,

were able to get their plants in such shape that they were ready for resumption of power last Saturday. Meanwhile specifications from miscellaneous sources continue at a good rate.

Sheet Steel Piling

Demand for sheet piling continues at a fair volume. There is little doubt that movement in this market will increase shortly due to damages sustained by bridges and locks during the recent high waters. The entire gates of one of the larger locks in this territory were ruined, and as a result a large coffer dam probably will be necessary in order to place new gates in position.

Plates and Shapes

Demand for plates to be used by car builders has shown satisfactory volume during the past 30 days, and there is indication that further improvement will continue in the near future. Damages to railroad cars during the flood will undoubtedly necessitate a large amount of repairs and replacements. In line with seasonal expectations, specifications are appearing for material to be used for tank cars. Tonnage for barge construction is coming in in good volume. While the tonnages being released in this market are not spectacular, nevertheless there has been improvement enough to create a feeling among the trade that the heavy industries are slowly but surely recovering lost ground.

Among the inquiries reported during the past week was 6500 tons for the Sixth Avenue subway in New York City. Bids are to be in by April 14.

Tubular Products

An order for 44,000 tons of seamless pipe, 22-in. in diameter, has been placed with National Tube Co. by the Columbia Gas & Electric Corp. This pipe line will run from Zionsville, Ind., to Detroit. Mean-

while specifications in oil-country goods continue to be the mainstay in this market.

Wire Products

Orders against first quarter quotations are still coming in, and there is a fairly active demand for barbed wire from the agricultural regions. One of the large local producers of wire products was able to continue production all last week, as its plants were unaffected by high waters. While shipments were greatly retarded during the middle of the week, gradual restoration of transportation facilities had taken place by Monday. Some plants in the district which were affected by the flood have been able during the past week to put a large part of the stock which had been submerged into salable condition.

Sheets

Although sheet production before the flood was at 73 per cent of capacity, a precipitous drop occurred by the middle of the week. While the plants of the leading interest were hard hit by the flood waters, resulting in a cessation of hot mill operations, the pickling plants and annealing furnaces were working by the first of the week. This made it possible for the reconditioning and shipment of stock which had become submerged. Large supplies of undamaged material on hand are moving forward. There is a possibility that the deadline for shipment on first quarter commitments made before the flood will be extended. However, it is not the intention of producers to accept new orders under first quarter quotations. There is evidence that damage to stocks in those plants which were affected by flood waters will not be nearly as great as had first been expected, due to success in reconditioning.

Tin Plate

While hot mill operations in some tin plate mills in this district were interrupted last week, sufficient

stocks were on hand so that, aside from the short breakdown in transportation facilities, shipments are steadily going forth to consumers. Operations at the leading producers' plants were curtailed to the extent that production dropped about 11½ points from 80 per cent to 68½ per cent of capacity. Hot mills at this plant were practically unaffected. In those mills where hot rolling operations were curtailed, annealing and tinning operations were going forward as early as last Sunday. A considerable tonnage of tin plate was released in this district by leading can producers. Submerged tin plate was and is being rapidly inspected, reconditioned and repacked, and in cases where necessary the material is being retinned. Demand for general line can and "beer plate" is in satisfactory volume.

Coal and Coke

A sudden cold spell was responsible for the re-entrance of the domestic trade into the coal and coke and coke market. Local jobbers, as a result, are busy since domestic consumers had been buying on a hand-to-mouth basis. A shortage of coal occurred when several coal mines were out of operation due to flood waters. In other cases stocks of jobbers were washed away. High water prevented movement of coal from the "captive" mines to the steel centers. Other industrial consumers were handicapped by the lack of fuel for the same reason. However, river traffic is partially open and freight movements of coal and coke are taking place.

Scrap

Although many dealers' yards were inundated last week during the flood, reconditioning of scrap has been going forward since Thursday. The \$16 price of No. 1 steel at Pittsburgh is still holding. There is a possibility that before the end of this week movement of scrap will be tight due to partial cessation of shipments coming into this district.

Weekly Indications of Steel Activity

From THE IRON AGE

	Mar. 24, 1936	Mar. 17, 1936	Feb. 25, 1936	Mar. 26, 1935	Average Year to Date	
					1936	1935
Steel ingot operations—Per cent of capacity	58.0	54.0*	55.0	46.5	53.2	49.5
	Week Ended				Year to Date	
	Mar. 24, 1936	Mar. 17, 1936	Feb. 25, 1936	Mar. 26, 1935	1936	1935
Fabricated structural steel awards.....	15,150	31,060	25,950	17,600	269,685	207,215
Fabricated plate awards.....	8,530	1,525	7,650	1,800	84,442	52,040
Sheet steel piling awards.....	700	0	7,685	100	14,745	5,216
Reinforcing bar awards.....	3,000	2,060	13,735	5,710	110,065	68,500

* Revised

Mining Industry Is Big Canadian Consumer

TORONTO, March 24.—New business is expanding at a steady rate in the Canadian iron and steel markets and plant operations are holding at their highest level since 1930. Current demand is chiefly for spot delivery but individual awards are in better volume than earlier in the year. No large contracts have been closed recently, but officials of some companies continue to look for orders for rails and rolling stock from the Canadian railroads.

The automotive industry is busy, and, as one of the largest consumers of raw materials, responsible for a strong demand for sheets, hardware, castings, etc. The mining industry steadily is becoming more active and some big orders have been closed recently for mining and milling equipment. Others are pending. Steel companies are considering plans for new additions and will make heavy expenditures on machinery and equipment replacements. Interests associated with the iron and steel industry look for further expansion within the next few weeks.

Demand for merchant pig iron is holding at its peak level for several years. Local blast furnace representatives state that sales of both foundry and malleable iron are in good volume. A few melters have placed contracts for second quarter delivery and others have sent out inquiries. Most melters, however, have shown no indication of departing from their policy of hand-to-mouth buying. Sales for the past week were slightly under 1200 tons made up of individual orders ranging from 50 to 300 tons.

The heavy snow that struck Ontario and particularly the Toronto district at the beginning of the week temporarily brought shipments to a standstill, but deliveries again have been resumed. Pig iron production is holding at its high level for the year with five furnaces blowing. Prices are firm and unchanged.

While general demand for iron and steel scrap is sustained and business is running at about the best level in a number of years, shortage of a few lines is affecting deliveries by dealers. For the second time in a month heavy snow has made movement of scrap practically impossible, but this difficulty is being overcome and shipments again are going forward.

The Roster of the Discerning

Here is a list of notables—leaders in their lines. They manufacture among them a wide range of equipment used by Industry. Many operations on this equipment are air actuated.

These machinery manufacturers—and many others that are not mentioned simply because this space is too small—equip their



"their customers profit"

product with air cylinders and, to enable their customers to make most efficient use of these machines—Ross Operating Valves are installed to insure quick, positive, economical control of the cylinders.

These firms are not leaders simply because they use Ross Operating Valves on their equipment. Rather, they choose Ross Operating Valves because they are leaders—they are discerning—they recognize the importance of faultless air control. Here is the list:

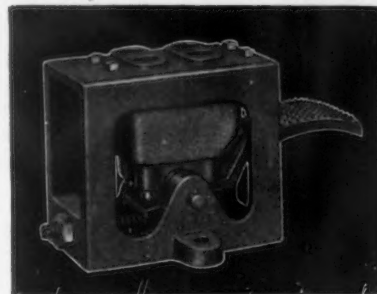
ARTER GRINDING MACHINE CO.
Grinding Machines
AJAX MANUFACTURING CO.
Forging Machines
CINCINNATI PLANNER CO.
Machine Tools
M. A. CUMING & CO.
Lat Blocking Machinery
DAYSTROM CORP.
Special Machinery
DIVINE BROTHERS CO.
Polishing Machines
EX-CELL-O AIRCRAFT & TOOL CORP.
Machine Tools
FEDERAL MACHINE & WELDER CO.
Welding Machines
GOGAN MACHINE CORP.
Automotive Machines
GENERAL MACHINERY CORP.
Presses

KINGSBURY MACHINE TOOL CORP.
Drilling Machines
R. K. LeBLOND MACHINE TOOL CO.
Lathes
LOCKE PATTERN WORKS
Special Machinery
NATIONAL AUTOMATIC TOOL CO.
Drilling Machines
NATIONAL MACHINERY CO.
Forging Machines
STEIN-HALL MFG. CO.
Paper Mill Machinery
SWIFT ELECTRIC WELDER CO.
Welding Machines
TAYLOR-WINFIELD CO.
Welding Machines
WEAN ENGINEERING CO.
Steel Mill Equipment

Quite a Roll Call

And the customers of these leading machinery manufacturers profit because wherever an air cylinder is triggered with a Ross Operating Valve, the operation is fast, sure and air-saving. The cylinder may be single or double acting. The operating valve may be solenoid, hand or foot controlled.

Every Ross Operating Valve—"A Bridle for Air Horsepower"—is so designed as to occupy minimum space on the machine. All ports are on one face and the valve is so mounted that all piping may be permanently installed—to remove a



"—or foot controlled"

valve, simply loosen the bolts that hold it to the base.

We have a booklet about the control of air cylinders. Perhaps you'd like a copy—whether you build or use air-operated equipment. We'll be glad to send you a copy. Ross Operating Valve Co., 6488 Epworth Blvd., Detroit, Michigan.

Management Group to Meet in Cleveland

MEN who are in charge of manufacturing in plants in all parts of the United States will gather at the Statler Hotel, Cleveland, April 16 and 17, for the annual production conference of the American Management Association. The conference will discuss problems of the manufacturing executives treated from the viewpoint of

changing from a depression to a production basis of plant operation.

The program is expected to show accurately just what problems are troubling manufacturing executives today. It results from surveys made by the A.M.A. vice-presidents in charge of the two production divisions. The surveys indicate that the most important jobs that management has today are those of rebuilding the working and supervisory forces and of modernizing equipment.

Chicago District Steel Output at 65 Per Cent



Production Rises $1\frac{1}{2}$ Points as
Demand Increases in All Directions
—Week's Tonnage Is Best of Year

CHICAGO, March 24.—Under a more pressing demand for both finished and semi-finished steel, mill operations have risen $1\frac{1}{2}$ points to 65 per cent of capacity. Further expansion not only is suggested by broadly increased industrial and construction activity, but by new sales and specifications as well. The record in each case is well above weekly averages for the year to date. Specifications include 10,000 tons of rails, but would have exceeded the weekly average anyhow.

Of interest was the report that the War Department had approved a project that is to be worked out in the mouth of the Chicago River and has to do with the control of the diversion of water for sanitary purposes. Also the Outer Drive bridge and highway developments

are active. This project will take 5000 tons of sheet steel piling, as well as other steel items.

Much of the general improvement in steel demand from all sources is an expected development of weather favorable to increased activity. At the same time, some of the incoming tonnage is that which had been held up until prices had been established for the second quarter.

Bars, shapes and plates reflect this new urge and additional railroad business is in prospect although it is not clear as yet what tonnages will be required from that field. A better demand for alloy steels is shown.

Pig Iron

Current shipments are 20 per cent ahead of last month and new

bookings continue to reflect operating gains of industrial consumers. Automotive demand has increased sharply while the tonnage being taken by the farm implement and tractor industries holds in undiminished volume. Orders from other consumers have shown proportionate improvement. Coke shipments also are gaining steadily along with the enlargement of foundry output.

Wire Products

Business is spreading out, with schedules of mill units advanced to fill a demand that is mostly for March delivery. Continued gains in second quarter bookings imply a fair acceptance of the new prices in which a reasonable balance was achieved. The largest volume of manufacturers' wire is going to the farm implement and automotive industries, although other industrial consumers have increased their takings. Improved distribution of fencing and other wire used on farms is reported through Kansas City, St. Paul and St. Louis. Demand for nails is slow in comparison.

Cast Iron Pipe

Although orders are mostly for small lots, the aggregate of tonnage on books of makers is much larger than it was at this time last year. The bulk of the tonnage, however, continues to come from State procurement offices and is largely for municipal water systems and extensions. The outlook is for additional expansion as the season advances.

Reinforcing Bars

A normally increasing demand is expected to be further augmented shortly by need of replacing structures damaged or completely destroyed in high water areas. Inquiry for bridge projects in northern Illinois amounts to approximately 200 tons. It is estimated that similar jobs in the southern half of the State will require equally as much material of that type. Shops are more active and shipments are increasing daily. Backlogs have scarcely been touched, but shipping releases are in early prospect. Current business includes a number of small-lot tonnages from WPA and PWA procurement offices. Private building demand also is showing some improvement. Prices are firm in most localities, but there still is some weakness.

Sheets

Tonnages have increased mildly with improvement divided between automotive and miscellaneous consumers. With the automotive in-

ARMSTRONG

Standard and Special

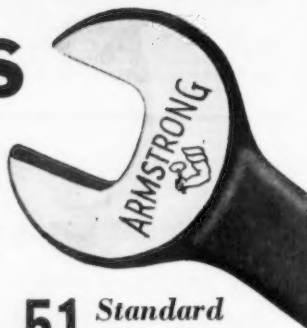
Drop Forged WRENCHES

With 51 types always in stock . . . all millings, all sizes from tiny miniatures to great 2-man wrenches . . . there are standard ARMSTRONG WRENCHES readily available to meet any normal industrial requirement. And, for those special demands, calls for special wrenches and special millings, an ample stock of forged wrench blanks is maintained to assure delivery on short notice.

ARMSTRONG Wrenches are quality wrenches drop forged from special analysis high carbon steel, improved in designs, in proportions and balance. They are heat treated, hardened and finely finished in black backed enamel with heads ground bright and plainly marked for size. They are stronger, finer tools, still cost no more than other quality wrenches.



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"The Tool Holder People"
309 N. Francisco Ave., Chicago, U.S.A.
New York San Francisco London



51 Standard Types with

opening milled for
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WHITWORTH Standard
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dustury showing a gain in output for the fourth consecutive week, however, there is every indication that orders from that source will show a sizable increase shortly. Tonnages bought at concession prices are reported at near the exhaustion point.

The State of Wisconsin has placed requirements for 1937 automobile license plates with Granite City Steel Co. and American Sheet & Tin Plate Co., tie bidders on 39,000 26-gage sheets, 32 x 123 in., at 3.15c., delivered at State Prison, Waupun, or 3c. f.o.b. mill, first quarter delivery. The total is approximately 350 tons.

Strip

Orders have increased sharply, with the betterment laid to release of business that had been held back until second quarter prices had been established. The situation mirrors automotive and miscellaneous improvement.

Rails

Demand for light rails from the coal mining regions of southern Illinois and elsewhere has picked up, but there has been no new buying of standard rails. Pending are substantial tonnages from the Rock Island and the Great Northern. The Alton, as well as the Soo Line, has yet to indicate its requirements. New shipping orders have been received on 10,000 tons of rails. Fair tonnages are involved in track accessory specifications. Orders for replacement of sections of railroad track washed out in recent floods are in prospect.

Plates

Some improvement is shown in this line, but with a part of the tonnage embodied in orders for other construction steels. Current demand for industrial tanks aggregates about 600 tons. Specifications from equipment makers and also from carriers that are building freight cars in their own shops have shown further gains.

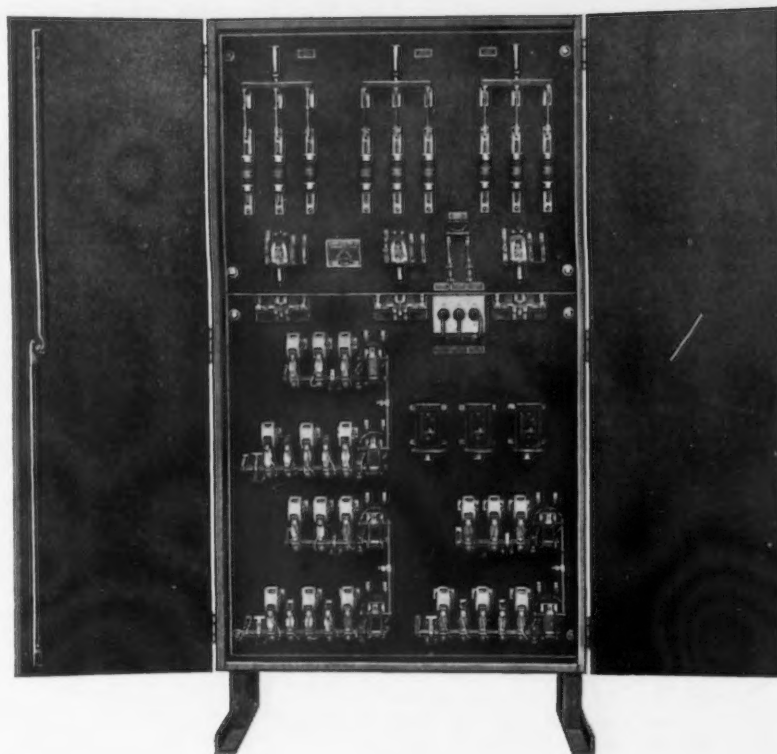
Bars

An active bar demand has followed improvement in automotive production, yet part of the improvement is traceable to increased buying by miscellaneous users. The situation is reflected in increased activity at forging shops. A heavy tonnage volume continues to go to the farm implement and tractor industries.

Structural Steel

Both sales and specifications are above weekly averages. The tonnage includes some private construction requirements, yet the largest portion represents demand for public works. A Chicago River project, to aid in reducing the

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amount of water diverted from Lake Michigan for sanitary purposes, will involve some structurals as well as other steels, including about 5000 tons of piling. There is much speculation as to the probable amount of construction steels that will be needed to replace structures washed out in recent floods. New awards aggregate 14,575 tons and inquiries, 2800 tons.

Scrap

This industry expects to benefit shortly by the improvement in mill

consumption, but as yet there have been no new sales. Contract demand has slowed on a few items, such as hydraulic compressed sheets, now quoted at \$13.75 to \$14.25 a gross ton and also on dealers' compressed sheets, priced currently at \$13.25 to \$13.75. The supply generally is fairly plentiful, but has not increased to any great extent owing to the heavy contract demand at mills. The latter, amplified by the prospect of further operating increases, are keeping the alinement reasonably stable.



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Bethlehem Takes Large St. Louis Pipe Job

ST. LOUIS, March 24.—The contract for 46,757 ft. of 60-in. welded steel pipe, calling for 8000 tons of steel for a conduit for the St. Louis water works has been awarded to Bethlehem Steel Co. Bids will be opened April 10 for 1000 tons of structural steel for a superstructure for a new approach and for 600 tons of 100-lb. rails for the St. Louis Municipal Bridge. Rogers Structural Steel Co. has been awarded 350 tons for a building for Owens-Illinois Glass Co. at Alton, Ill.

Improvement is noted in all lines of finished steel especially galvanized roofing and fencing. There has been a lull in private construction, public works still carrying the load in that industry.

A better demand for pig iron is reported, and March shipments will be fairly heavy. Stocks of melters who bought heavily during the last quarter of 1935 are pretty well cleaned up, and while most of the buying is for immediate requirements, there is some contract purchasing for shipment through the second quarter. However, it is not believed that there will be buying for shipment into the third quarter, as prices are firm. Agricultural implement concerns continue to work night shifts, and expect to be operating at that rate for several

months longer. Stove operations continue heavy.

A decline of 25c. a ton on Nos. 1 and 2 heavy melting steel and No. 2 wrought is reported, as a result of freer offerings from the country dealers and light buying by the steel mills in the district.

Cincinnati Steel Output Unaffected by Floods

CINCINNATI, March 24.—As in other river areas, the almost unprecedented flood retarded activity in the metal working markets during the past week. Old materials felt the reaction most keenly and, for the first time this year, the market undertone tended soft. Barge shipments were retarded and mill embargos were reported in some areas. While no formal change in dealers' bids was announced, the purchase of 2000 tons of miscellaneous scrap by one mill was reported at less than the current market and the prior bullishness of dealers gave way to a careful watching of market trends.

District sheet mills opened books for second quarter under the new differentials without any flurry to cover for future needs. The steady business rate establishment during this quarter is apparently well sustained and will continue without sudden spurts. New business the past week was close to mill capacity and the leading interest is

refusing business on some grades for delivery before March 31.

Steel making activity is unchanged, with 30 out of 39 open-hearth still in operation. With the crest of the Ohio River flood expected, however, some restriction on river plant operation is anticipated.

Reinforcing Steel

Awards 3000 Tons—New
Projects 5900 Tons

AWARDS

State of Rhode Island, 205 tons, three State bridges, to Joseph T. Ryerson & Son, Inc.

New York, 690 tons, for Procurement Division of Treasury, to W. S. Ames & Co.

Coatesville, Pa., 375 tons, Veterans' hospital, to Bethlehem Steel Co.

Philadelphia, 380 tons, school, to Truscon Steel Co.

Philadelphia, 275 tons, school, to Concrete Steel Co.

Salinas, Cal., 503 tons, County court house, to Truscon Steel Co.

Los Angeles, 130 tons, two buildings for Federated Metals Co., to Truscon Steel Co.

Puyallup, Wash., 110 tons, State highway work, to Bethlehem Steel Co.

Seattle, 200 tons, pattern shop for Continental Can Co., to an unnamed bidder.

Estacada, Wash., 105 tons, State bridge over Clackamas River, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

St. Louis, 120 tons, wash building for Robert Koch hospital; H. B. Deal & Co., general contractors.

State of Wyoming, 109 tons, three bridges in two counties; bids opened March 26.

Winnemucca, Nev., 161 tons, State bridge and overpass; bids April 8.

Reno, Nev., 100 tons, State underpass; bids April 15.

Phoenix, Ariz., 108 tons, building at State fair grounds; bids April 23.

Alameda, Cal., 127 tons, Alameda high school; bids opened.

Long Beach, Cal., 1220 tons, retaining wall on Alamitos Bay; bids March 31.

Los Angeles, 100 tons, Narbonne high school; bids opened.

Pomona, Cal., 150 tons, women's dormitory at Pomona College; bids opened.

Pasadena, Cal., 100 tons, El Molino school; bids opened.

Yuma, Ariz., 627 tons, railroad bridge and Araz Wash overchute on All-American Canal; bids April 16.

Denver, 869 tons, material for All-American Canal project under six specifications; bids opened by Bureau of Reclamation.

Denver, 1811 tons, material for Columbia Basin project under four specifications; bids opened by Bureau of Reclamation.

Denver, 116 tons, material for Casper-Alcova project; bids opened in February but steel award pending.

Denver, 155 tons, material for Salt River project; bids under advisement by Bureau of Reclamation.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh	1.85c.
F.o.b. Chicago	1.90c.
F.o.b. Gary	1.90c.
F.o.b. Duluth	2.00c.
Del'd Detroit	2.00c.
F.o.b. Cleveland	1.90c.
F.o.b. Buffalo	1.95c.
Del'd Philadelphia	2.10c.
Del'd New York	2.20c.
F.o.b. Birmingham	2.00c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars Pacific ports	2.40c.

Roll Steel

(For merchant trade)	
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Pittsburgh (refined)	2.10c.
Delivered New York	2.05c.
Delivered Philadelphia	2.10c.

Cold Finished Bars and Shafting*

Base per Lb.	
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,999 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton	
F.o.b. Pittsburgh	\$54.00
F.o.b. Chicago	\$4.00
F.o.b. Duluth	\$5.00
F.o.b. Cleveland	\$4.00
F.o.b. Birmingham	\$7.00
F.o.b. Houston, Orange, Beaumont,	
Galveston	63.00
F.o.b. Mobile	62.00
F.o.b. New Orleans, Lake Charles,	
Corpus Christi	63.00
F.o.b. cars dock Pacific ports	67.00

Plates

Base per Lb.	
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.95c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.90c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	2.30c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.95c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.	
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.10c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.45c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, f.o.b. Detroit	2.55c.
No. 10 gage, del'd Phila.	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.00c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating	
f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.95c.
No. 20, f.o.b. Gary	3.05c.
No. 20, f.o.b. Birmingham	3.35c.
No. 20, f.o.b. cars dock Pacific ports	3.55c.
No. 10, f.o.b. Pittsburgh	2.35c.
No. 10, f.o.b. Gary	2.45c.
No. 10, f.o.b. Birmingham	2.95c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast	3.35c.

Tin Plate

Base per Box

Standard cokes, f.o.b. P'gh district	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

Base per Lb.	
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

Base per Lb.	
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade Per Lb.

Bright wire	2.30c. to 2.40c.
Spring wire	2.90c. to 3.05c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg	
Standard wire nails	\$2.10
Smooth coated nails	2.10

Base per 100 Lb.

Annealed fence wire	\$2.45 to \$2.65
Galvanized fence wire	2.80 to 3.00
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Twisted barbed wire	2.60
Woven wire fence, base column	58.00
Single loop bale ties, base column	51.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh, and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Inches	Black Galv.	Wrought Iron
1/2	57	57
3/4	60	44 1/2
1	64 1/2	55
1 1/4	67 1/2	59
1 3/4	69 1/2	61 1/2

Lap Weld

2	62	53 1/2
2 1/2	65	56 1/2
3	67	58 1/2
3 1/2	68	59 1/2
4	69	60 1/2
4 1/2	70	61 1/2
5	71	62 1/2
5 1/2	72	63 1/2
6	73	64 1/2
6 1/2	74	65 1/2
7	75	66 1/2
7 1/2	76	67 1/2
8	77	68 1/2
8 1/2	78	69 1/2
9	79	70 1/2
9 1/2	80	71 1/2
10	81	72 1/2
10 1/2	82	73 1/2
11	83	74 1/2
11 1/2	84	75 1/2
12	85	76 1/2

Butt Weld, extra strong, plain ends

1/2	55 1/2	42 1/2
3/4	57 1/2	46 1/2
1	60 1/2	50 1/2
1 1/4	62 1/2	54 1/2
1 3/4	64 1/2	58 1/2
2	66 1/2	61 1/2

Lap Weld, extra strong, plain ends

2	60	52 1/2
2 1/2	63	55 1/2
3	66	58 1/2
3 1/2	68	60 1/2
4	70	62 1/2
4 1/2	72	64 1/2
5	74	66 1/2
5 1/2	76	68 1/2
6	78	70 1/2
6 1/2	80	72 1/2
7	82	74 1/2
7 1/2	84	76 1/2
8	86	78 1/2
8 1/2	88	80 1/2
9	90	82 1/2
9 1/2	92	84 1/2
10	94	86 1/2
10 1/2	96	88 1/2
11	98	90 1/2
11 1/2	100	92 1/2
12	102	94 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold	Hot
		Drawn	Boiled
1 in. o.d.	13 B.W.G.	\$ 8.60	\$ 7.83
1 1/2 in. o.d.	13 B.W.G.	10.19	9.36
1 1/2 in. o.d.	13 B.W.G.	11.26	10.33
1 1/2 in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2 1/2 in. o.d.	13 B.W.G.	16.00	14.54
2 1/2 in. o.d.	12 B.W.G.	17.61	16.01
2 1/2 in. o.d.	12 B.W.G.	19.29	17.54
3 in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.59
4 1/2 in. o.d.	10 B.W.G.	41.08	37.35
3 1/2 in. o.d.	11 B.W.G.	27.09	24.63
4 in. o.d.	10 B.W.G.	33.60	30.54
4 1/2 in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbed Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Steel	Iron
1 1/2 in. o.d.	13 B.W.G.....	\$ 9.72	\$20.16
1 1/2 in. o.d.	13 B.W.G.....	11.06	21.84
2 in. o.d.	13 B.W.G.....	12.38	27.23
2 1/4 in. o.d.	13 B.W.G.....	13.79	29.53
2 1/2 in. o.d.	12 B.W.G.....	16.58	24.19
2 3/4 in. o.d.	12 B.W.G.....	17.54	26.40
3 in. o.d.	12 B.W.G.....	18.35	28.39
3 1/4 in. o.d.	11 B.W.G.....	21.56	33.95
3 3/4 in. o.d.	11 B.W.G.....	23.15	36.16
4 in. o.d.	10 B.W.G.....	28.66	45.36
4 1/2 in. o.d.	10 B.W.G.....	35.22	50.48
5 in. o.d.	9 B.W.G.....	44.25	61.86
6 in. o.d.	7 B.W.G.....	68.14	102.46

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List	
Machine and carriage bolts:	
1/2 in. x 6 in. and smaller.....	70, 10 and 5
Larger than 1/2 in.....	70 and 10
Lag bolts.....	70 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70 and 10
Hot-pressed nuts, blank or tapped, square.....	70 and 10
Hot-pressed nuts, blank or tapped, hexagon.....	70 and 10
C.p.c. and t. square or hex. nuts, blank or tapped.....	70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter.....	60, 20 and 15
Larger than 1 in. diameter.....	60, 20 and 15
Stove bolts in packages, Pittsburgh.....	72 1/2 and 10
Stove bolts in packages, Cleveland.....	72 1/2 and 10
Stove bolts in bulk, Pittsburgh.....	82 1/2
Stove bolts in bulk, Cleveland.....	82 1/2
Stove bolts in bulk, Cleveland.....	82 1/2
Tire bolts.....	55

Large Rivets (1/2-in. and larger)

Base per 100 Lb.	
F.o.b. Pittsburgh or Cleveland.....	\$2.90
F.o.b. Chicago.....	3.00
F.o.b. Birmingham.....	3.05

Small Rivets (7/16-in. and smaller)

Per Cent Off List	
F.o.b. Pittsburgh.....	70 and 5
F.o.b. Cleveland.....	70 and 5
F.o.b. Chicago and Birmingham.....	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List	
Milled cap screws, 1 in. dia. and smaller.....	80, 10 and 5
Milled standard set screws, case hardened, 1 in. dia. and smaller.....	75
Milled headless set screws, cut thread 1/2 in. and smaller.....	75
Upset hex. head cap screws U.S.S. or S.A.E., thread 1 in. and smaller.....	85
Upset set screws, cut and oval points.....	75 and 10
Milled studs.....	65 to 85 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.....	Uncropped
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Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.....	Base price, \$49 a gross ton.
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Alloy Steel Bars

Price del'd Detroit is \$52.	
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.....	Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....	2.60c.

Alloy Series

Differential Numbers per 100 lb.	
2000 (1/4% Nickel).....	0.25
2100 (2 1/4% Nickel).....	0.95
2300 (3 1/4% Nickel).....	1.50
2500 (5% Nickel).....	2.25
3100 Nickel Chromium.....	0.55
3200 Nickel Chromium.....	1.35
3300 Nickel Chromium.....	3.80
3400 Nickel Chromium.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel).....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45
5100 Chromium Spring Steel.....	base
6100 Chromium Vanadium Bar.....	1.10c.
6100 Chromium Vanadium Spring Steel.....	0.70
Chromium Nickel Vanadium.....	1.40
Carbon Vanadium.....	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.	
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STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)	
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(Base Prices F.o.b. Pittsburgh)

Forcing billets.....	19.55c.
Bars.....	23c.
Plates.....	26c.
Structural shapes.....	23c.
Sheets.....	33c.
Hot-rolled strip.....	20 1/2c.
Cold-rolled strip.....	27c.
Drawn wire.....	23c.

Raw and Semi-Finished Steel

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton	
Rerolling.....	\$28.00
Forging quality.....	35.00

Delivered Detroit

Rerolling.....	\$31.00
Forging.....	38.00

Billets Only F.o.b. Duluth

Rerolling.....	\$30.00
Forging.....	37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton	
Open-hearth or Bessemer.....	\$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.	
Grooved.....	1.80c.
Universal.....	1.80c.
Sheared.....	1.80c.

Wire Rods

(Nos. 4 and 5)

Per Gross Ton	
F.o.b. Pittsburgh.....	\$38.00
F.o.b. Cleveland.....	38.00
F.o.b. Chicago.....	39.00
F.o.b. Anderson, Ind.....	39.00
F.o.b. Youngstown.....	39.00
F.o.b. Worcester, Mass.....	40.00
F.o.b. Birmingham.....	41.00
F.o.b. San Francisco.....	47.00
F.o.b. Galveston.....	44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.....	\$20.50	\$21.00	\$20.00	\$21.50
Bethlehem, Pa.....	20.50	21.00	20.00	21.50
Birdsboro, Pa.....	20.50	21.00	20.00	21.50
Swedeland, Pa.....	20.50	21.00	20.00	21.50
Steelton, Pa.....	20.50	21.00	20.00	21.50
Sparrows Point, Md.....	20.50	21.00	20.00	21.50
Neville Island, Pa.....	19.50	19.50	19.00	20.00
Sharpsville, Pa.....	19.50	19.50	19.00	20.00
Youngstown.....	19.50	19.50	19.00	20.00
Buffalo.....	19.50	20.00	18.50	20.50
Erie, Pa.....	19.50	20.00	19.00	20.50
Cleveland.....	19.50	19.50	19.00	20.00
Toledo, Ohio.....	19.50	19.50	19.00	20.00
Jackson, Ohio.....	21.25	21.25	20.75	21.25
Detroit.....	19.50	19.50	19.00	20.00
Hamilton, Ohio.....	19.50	19.50	19.00	20.00
Chicago.....	19.50	19.50	19.00	20.00
Granite City, Ill.....	19.50	19.50	19.00	20.00
Duluth, Minn.....	20.00	20.00	19.50	20.50
Birmingham.....	15.50	15.50	14.50	20.00
Provo, Utah.....	17.50	17.50	17.00	17.00

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.....	\$21.00	\$21.50	\$20.50	\$22.00
Brooklyn				
From Eastern Pa.....	22.9289	23.4289	22.4873	22.9873
Newark or Jersey City, N. J.				
From Eastern Pa.....	21.9873	22.4873	21.4873	22.9873
Philadelphia				
From Eastern Pa.....	21.3132	21.8132	20.8132	22.3132
Cincinnati				
From Hamilton, Ohio.....	20.5807	20.5807	20.0807	21.0807
Canton, Ohio				
From Cleveland and Youngstown.....	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio				
From Hamilton, Ohio.....	21.64	21.64	21.14	21.64
Mansfield, Ohio				
From Cleveland and Toledo.....	21.3832	21.3832	20.8832	21.8832
Indianapolis				
From Hamilton, Ohio.....	21.9289	21.9289	21.4289	21.9289
South Bend, Ind.				
From Chicago.....	21.6935	21.6935	21.1935	21.6935
Milwaukee				
From Chicago.....	20.57	20.57	20.07	20.57
St. Paul				
From Duluth.....	21.94	21.94	21.44	21.94
Davenport, Iowa				
From Chicago.....	21.3832	21.3832	20.8832	21.3832
Kansas City				
From Granite City.....	22.2178	22.2178	21.7178	22.2178
San Francisco, Los Angeles or Seattle, From Provo.....	22.315	22.315	21.815	22.315

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....\$24.00

GRAY FORGE PIG IRON

Valley furnace.....	\$19.00
Pittsburgh district furnace.....	19.00

CHARCOAL PIG IRON

Lake Superior furnace.....\$22.00

Delivered Chicago.....25.258

Delivered Buffalo.....25.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$21.00
No. 2 fdy., sil. 1.75 to 2.75.....	20.50
Malleable.....	22.50

Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$22.50
No. 2 fdy., sil. 1.75 to 2.25.....	22.00
Malleable.....	22.50
Basic.....	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton	
Domestic, 80% (carload).....	\$75.00

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%.....	\$26.00
50-ton lots 3-mo. shipment.....	24.00
F.o.b. New Orleans.....	26.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads).....	\$77.50
50% (ton lots).....	85.00
75% (carloads).....	126.00
75% (ton lots).....	130.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	
6.00 to 6.50%.....	\$22.75
6.51 to 7.00%.....	23.25
7.01 to 7.50%.....	23.75
7.51 to 8.00%.....	24.25
8.01 to 8.50%.....	24.75
8.51 to 9.00%.....	25.25
9.01 to 9.50%.....	25.75
9.51 to 10.00%.....	26.25
10.01 to 10.50%.....	26.75
10.51 to 11.00%.....	27.25
11.01 to 11.50%.....	27.75
11.51 to 12.00%.....	28.25

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	
10.00 to 10.50%.....	\$31.75
10.51 to 11.00%.....	32.25
11.01 to 11.50%.....	32.75
11.51 to 12.00%.....	33.25
12%.....	33.75

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads.....	\$1.30
Ferrotungsten, lots of 5000 lb.....	1.35
Ferrotungsten, smaller lots.....	1.40
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in car loads, and contract.....	10.00c.
Ferrocromium, 2% carbon.....	16.50c. to 17.00c.
Ferrocromium, 1% carbon.....	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon.....	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon.....	20.00c. to 20.50c.
Ferrovandium, del. per lb. contained V.....	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.....	\$2.50
Ferrocobalt, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton.....	\$137.50
Ferrocobalt, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18% with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton.....	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.....	75.00
Ferromolybdenum, per lb. Mo. del. Calcium molybdate, per lb. Mo. del.....	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads.....	\$38.00
Ton lots or less, per ton.....	45.50
Silico-manganese, gross ton, delivered.....	35.00
2.50% carbon grade.....	90.00
2% carbon grade.....	100.00
Spot prices.....	\$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$15.50 to \$16.00
No. 2 heavy melting steel	14.00 to 14.50
No. 2 railroad wrought	15.50 to 16.00
Scrap rails	15.75 to 16.25
Rails, 3 ft. and under	16.50 to 17.00
Compressed sheet steel	15.50 to 16.00
Hand bundled sheet steel	14.00 to 14.50
Hvy. steel axle turnings	13.50 to 14.00
Machine shop turnings	10.50 to 11.00
Short shov. turnings	10.50 to 11.00
Short mixed borings and turnings	8.25 to 9.25
Cast iron borings	10.50 to 11.00
Cast iron carwheels	14.00 to 14.50
Heavy breakable cast	13.00 to 13.50
No. 1 cast	15.00 to 15.50
Railr. knuckles and couplers	17.25 to 17.75
Rail. coil and leaf springs	17.25 to 17.75
Roller steel wheels	17.25 to 17.75
Low phos. billet crops	18.00 to 18.50
Low phos. sheet bar crops	17.50 to 18.00
Low phos. punchings	17.00 to 17.50
Low phos. plate scrap	17.00 to 17.50
Steel car axles	16.00 to 16.50

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton

Heavy melting steel	\$14.50 to \$15.00
Automobile hvy. melt steel	12.50 to 13.00
Shoveling hvy.	14.50 to 15.00
Hydraulic comp. sheets	14.00 to 14.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.50 to 14.00
Roller carwheels	16.00 to 16.50
Railroad tires	16.00 to 16.50
Railroad leaf springs	16.00 to 16.50
Axis turnings	13.00 to 13.50
Steel couplers and knuckles	16.00 to 16.50
Coil springs	16.50 to 17.00
Axis turnings (elec. fur.)	14.25 to 14.75
Low phos. punchings	17.00 to 17.50
Low phos. plates, 12 in. and under	17.00 to 17.50
Cast iron borings	7.50 to 8.00
Short shoveling turnings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
Revolving rails	15.50 to 16.00
Steel rails less than 3 ft.	17.25 to 17.75
Steel rails less than 2 ft.	17.50 to 18.00
Angle bars	14.00 to 14.50
Cast iron carwheels	14.00 to 14.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	14.50 to 15.00

Per Net Ton

Iron car axles	\$18.50 to \$19.00
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
No. 2 busheling, old	7.50 to 8.00
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast	13.00 to 13.50
Clean automobile cast	12.50 to 13.00
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	12.75 to 13.25
Stove plate	8.00 to 8.50
Grate bars	9.50 to 10.00
Brake shoes	9.75 to 10.25

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$13.50 to \$14.00
No. 2 heavy melting steel	12.00 to 12.50
Hydraulic compressed, new	12.00 to 12.50
Hydraulic compressed, old	9.50 to 10.00
Steel rails for rolling	14.50 to 15.00
Cast iron carwheels	14.50 to 15.00
Heavy breakable cast	13.50 to 14.00
No. 1 cast	14.00 to 14.50
Stove plate (steel works)	11.00 to 11.50
Railroad malleable	16.50 to 17.00
Machine shop turnings	8.00 to 8.50
No. 1 blast furnace	6.25
Cast borings	6.00
Heavy axle turnings	10.25 to 11.75
No. 1 low phos. heavy	17.00 to 17.50
Couplers and knuckles	17.00 to 17.50
Roller steel wheels	17.00 to 17.50
Steel axles	16.50 to 17.00
Shafting	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
Spec. iron and steel pipe	10.50 to 11.00
Bundled sheets	11.00 to 11.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$12.00 to \$12.50
No. 2 heavy melting steel	10.00 to 10.50
Scrap rails for melting	11.50 to 12.00
Loose sheet clippings	7.50 to 8.00
Bundled sheets	9.00 to 9.50
Cast iron borings	7.00 to 7.50
Machine shop turnings	7.75 to 8.25
No. 1 busheling	9.50 to 10.00
No. 2 busheling	5.25 to 5.75
Rails for rolling	12.00 to 12.50
No. 1 locomotive tires	10.50 to 11.00
Short rails	15.00 to 15.50
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	12.50 to 13.00
No. 1 railroad cast	11.75 to 12.25
Burnt cast	8.75 to 9.25
Stove plate	8.75 to 9.25
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.50 to 13.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$14.50 to \$15.00
No. 2 heavy melting steel	13.50 to 14.00
Compressed sheet steel	13.50 to 14.00
Light bundled sheet stampings	10.00 to 10.50
Drop forge flashings	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Short shoveling turnings	8.75 to 9.25
No. 1 busheling	13.50 to 14.00
Steel axle turnings	13.00 to 13.50
Low phos. billet crops	17.50 to 18.00
Cast iron borings	9.00 to 9.50
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	15.00 to 15.50
Railroad grate, comp. sheets	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.50 to 18.00
Rails for rolling	17.00 to 17.50
Railroad malleable	17.75 to 18.50
Cast iron carwheels	15.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	\$13.50
No. 2 heavy melting scrap	\$12.00 to 12.50
Scrap rails	13.00 to 13.50
New hydraulic, comp. sheets	12.00 to 12.50
Old hydraulic, comp. sheets	11.00
Drop forge flashings	11.50 to 11.75
No. 1 busheling	12.00 to 12.50
Hvy. steel axle turnings	12.00 to 12.50
Machine shop turnings	8.00 to 8.50
Knuckles and couplers	15.50 to 16.00
Coil and leaf springs	15.50 to 16.00
Roller steel wheels	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Short shov. steel turnings	8.25 to 8.75
Short mixed borings and turnings	8.25 to 8.75
Cast iron borings	8.25 to 8.75
No. 2 busheling	7.00
Steel car axles	14.00 to 14.50
Iron axles	12.50 to 13.00
No. 1 machinery cast	13.50 to 14.00
No. 1 cupola cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	12.00 to 12.50
Railroad malleable	16.25 to 16.75
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	\$11.00 to \$11.25
No. 1 heavy melting steel	9.40 to 9.90
*Scrap rails	11.00 to 11.25
*No. 2 steel	9.40 to 9.90
No. 2 steel	10.00 to 10.25
*No. 2 steel	8.75 to 9.00
Breakable cast	8.75
*Machine shop turnings	5.75 to 5.85
Machine shop turnings	4.40
Handled skeleton, long	8.00 to 8.05
Shafting	13.75
Engine blocks, stripped	8.50
Cast iron borings, chemical	5.00 to 7.00
Cotton ties	6.00
*Stove plate	7.00

Per gross ton delivered consumers' yards:

Textile cast	\$10.50 to \$11.00
No. 1 machinery cast	10.50 to 11.00
Stove plate	6.50 to 7.00

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$9.50 to \$9.75*
No. 2 heavy melting steel	8.50 to 8.75*
Heavy breakable cast	9.00 to 9.50
No. 1 machinery cast	10.00 to 10.50
No. 2 cast	7.50 to 8.00
Stove plate	17.50 to 18.00
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought long	8.50 to 9.00
Spec. iron and steel pipe	8.50 to 9.00
Forge fire	7.50 to 8.00
Rails for rolling	11.00 to 12.00
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace	3.00 to 3.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	5.75 to 6.25

Per gross ton, delivered local foundries:

No. 1 heavy melting steel	\$12.00
No. 1 hvy. cast (cupola size)	10.00
No. 2 cast	8.50

* Loading on barge.
* 75c. to \$1.00 higher offered at nearby New Jersey points for rail shipments.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	\$11.00 to \$11.50
Scrap steel rails	11.50 to 12.00
Short shoveling turnings	7.00
Stove plates	8.00
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected heavy steel	\$12.50 to \$13.00
No. 1 heavy melting	12.25 to 12.75
No. 2 heavy melting	11.25 to 11.75
No. 1 locomotive tires	11.00 to 11.50
Misc. stand-sec. rails	13.00 to 13.50
Railroad springs	14.00 to 14.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	12.25 to 12.75
No. 1 busheling	7.50 to 8.00
Cast iron borings and shoveling turnings	4.50 to 5.00
Rails for rolling	13.75 to 14.25
Machine shop turnings	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	10.50 to 11.00
Steel rails less than 3 ft.	13.50 to 14.00
Steel angle bars	13.00 to 13.50
Cast iron carwheels	11.00 to 11.50
No. 1 machinery cast	11.25 to 11.75
Railroad malleable	14.25 to 14.75
No. 1 railroad cast	11.25 to 11.75
Stove plate	7.50 to 8.00
Agricult. malleable	12.50 to 13.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$11.25 to \$11.75
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ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.I.F. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% iron dry Spanish or Algeria	10.25c.
Iron, low phos., Swedish, average 68% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Manganese, Caucasian, washed 52% 48%	25c.
Manganese, African, Indian, 48-51%	26c.
Manganese, Brazilian, 46 to 48% 48%	24c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered, nominal	\$16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

Per Gross Ton

Chrome, 45% Cr ₂ O ₃ , lamp, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 46% Cr ₂ O ₃ (Turkish)	16.50 to 17.00
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	19.25
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	22.00
52% Cr ₂ O ₃ (Turkish)	21.75
48 to 49% Cr ₂ O ₃ (Turkish)	19.25

Fluorspar

Per Net Ton

Domestic, washed gravel, .85-5, f.o.b. Kentucky and Illinois mines for all rail shipment	\$18.00
No. 2 lump, .85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	35.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville	\$3.65 to \$3.80
Prompt	4.25 to 5.75
Foundry, f.o.b. Connellsville	
Prompt	
Foundry, by-product, Chicago ovens, for delivery outside switching district	9.00
Foundry, by-product, delivery in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.50
Foundry, by-product, Newark or Jersey City, del'd	9.65
Foundry, by-product, Phila.	9.38
Foundry, by-product, Cleveland, delivered	9.75
Foundry, by-product, Cincinnati, del'd	9.50

No. 2 heavy melting steel	\$9.75 to \$10.25
Borings and turnings	7.00 to 7.50
Log turnings	6.50 to 7.00
Short shoveling turnings	7.25 to 7.75
No. 1 machinery cast	14.00 to 14.50
Automotive cast	14.00 to 14.50
Hydraulic comp. sheets	12.00 to 12.50
Stove plate	8.75 to 9.25
New factory busheling	10.75 to 11.25
Old No. 2 busheling	5.75 to 6.25
Sheet clippings	8.75 to 9.25
Flashings	10.50 to 11.00
Low phos. plate scrap	11.50 to 12.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	\$7.50	\$7.00
Rails, scrap	8.50	8.00
Machine shop turnings	4.00	4.00
Boiler plate	7.00	6.00
Heavy axle turnings	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	4.00
Steel axles	8.50	9.00
Axles, wrought iron	9.00	9.50
No. 1 machinery cast	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shoveling steel	6.50	6.00
Bushings	6.00	5.50
Compressed sheets	6.50	6.00

Foundry, Birmingham

Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.90 to 2.10
Gas coal, %-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.35c.
No. 4 industrial	3.87c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.25c.
No. 4 industrial	3.87c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	5.00c.
No. 5 industrial fuel oil	3.77c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	6.00c.
No. 4 industrial	5.75c.
No. 5 industrial	5.25c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works	
	High-heat Intermediate Duty Brick Duty Brick
Pennsylvania	\$45.00 \$40.00
Maryland	45.00 40.00
New Jersey	50.00 43.00
Ohio	40.00 35.00
Kentucky	45.00 40.00
Missouri	45.00 40.00
Illinois	45.00 40.00
Ground fire clay, per	
	7.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under 1/4 in.	3.30c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	2.95c.
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list	
Machine bolts, 100 count, 65 per cent off list	
Carriage bolts, 100 count, 65 per cent off list	
Nuts, all styles, 100 count, 65 per cent off list	
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'l'd, base per 100 lb.	2.65c.
Wire, galv. soft, base per 100 lb.	3.00c.
Common wire nails, per keg	2.50c.
Cement coated nails, per keg	2.60c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.
*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
Per Cent Off List	
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	*87.5 and 10
Cut point set screws	*75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57.5
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Comm. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.
*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.
†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.31c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24)*	3.89c.
Galvanized sheets (No. 24)*	special
Long term sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/2 in. and larger	3.75c.
Open hearth spring steel, 4.00c. to 10.00c.	
Common wire nails, base, per keg	\$3.21
Per Cent Off List	
Machine bolts, square head and nut:	
All diameters	.65 and 10
Carriage bolts, cut thread:	
All diameters	.65 and 10

Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts;	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
*Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
*Hot-rolled anneal. sheets (No. 24)	3.65c.
*Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 25 bundles or over.
‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.10c.
†Cold-finished steel bars	3.50c.
Flat-rolled steel under 1/4 in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	\$2.40
*No. 9 galv. wire, per 100 lb.	2.75
*Comm. wire nails, base per keg	2.35

†Outside delivery 10c. less.
*For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	.55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Comm. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.88c.
Struc. shapes	3.25c.
Soft steel bars	3.05c.
Reinforcing bars	2.60c.

Cold-fin. flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in. 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Comm. wire nails, base per keg	\$3.15
Black wire, base per 100 lb. (2500-lb. lots or under)	3.50
(Over 2500 lb.)	3.40

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheered, tank and univ. mill.	3.56c.
1/4 in. thick and heavier	3.56c.
Floor plates, diamond pattern	3.36c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and	
No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24	
Ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)**	4.72c.
Bands	3.39c.
Hoops	3.39c.
*Cold-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases,	
70 and 10 per cent off list	
Broken cases	.70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.
*Price applies to 1,000 lb. and over.
*With reduction in chemical extras.
**0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in. flats and fillet angles	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Roller rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.15c.
Comm. wire nails	2.85c.
Cement coated nails	2.85c.

	Per Cent Off List
Machine bolts	.70 and 10
Carriage bolts	.70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	.70 and 10

Prices given above are delivered Milwaukee.
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
*Mild steel bars	3.00c.

**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10	3.10c.
†Hot-rolled annealed sheets, No. 24	3.60c.
†Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
*Cold-rolled rounds	3.58c.
*Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	.60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb. add 50c.
‡25 bundles and over, base. For 10 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.
§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 500 to 499 lb. add \$1.00; for 0 to 299 lb. add \$1.75; for combined order under 100 lb. add \$3.00.
**For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.16c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	.65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.55c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$2.95
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb.
San Francisco	
Los Angeles	
Seattle	

Plates, tank and	3.25c.	3.60c.	3.55c.
U. M.	3.25c.	3.60c.	3.55c.
Shapes, standard	3.25c.	3.60c.	3.55c.
Soft steel bars	3.25c.	3.60c.	3.70c.
Reinforcing bars			
f.o.b. cars dock	2.45c.	2.45c.	2.45c.
Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sets (No. 24)	4.00c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24)	4.50c.	4.95c.	5.00c.
Cold finished steel			
Rounds	5.80c.	5.85c.	6.00c.
Squares and hexagons	7.05c.	7.10c.	7.25c.
Plats	7.55c.	7.60c.	8.25c.
Common wire nails			
—base per keg			
less carload	\$3.20	\$3.20	\$3.20

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	17c.

Cleveland Steel Output Continues to Increase



Production in Cleveland - Lorain Area Now at 82 Per Cent of Capacity—Northern Ohio Escapes Flood Damage

CLEVELAND, March 24.—Escaping floods which caused temporary suspensions in the Pittsburgh district last week, Northern Ohio steel plants, including Youngstown mills, maintained recent operations without interruptions. Ingot output in the Cleveland-Lorain territory again increased this week, having been stepped up three points to 82 per cent of capacity by the addition of a furnace in Lorain, where 12 open-hearths are now operating. Republic Steel Corp'n. will blow in the fourth blast furnace at the Corrigan-McKinney plant Thursday.

Specifications for sheets and strip steel have continued to pour in to the mills in good volume because of the present price advantage to consumers on these products over the prices that will apply during the second quarter with the new quantity differentials. Most producers of flat-rolled steel are now filled up with these products for the remainder of the month and have withdrawn from the market for March business. The only flat-rolled product that one large producer is now taking for March shipment is hot-rolled strip.

Producers will not be able to ship this month all the steel that has been ordered for March delivery. While this means the carrying over of shipment of some steel until next month, mills do not intend to allow deliveries of the lower-priced material to extend far into April. Finishing mills are being operated at full capacity in order to clean up shipments as far as possible this month. Confidence of buyers has been built up by the open market price policy and this has caused the elimination of a hesitancy on the part of some buyers to place orders.

Buying by automobile companies for April shipment under the new price schedules is proceeding in fair volume and some of the mills have already accumulated quite a backlog. However, recent purchases for March shipment by that industry apparently cover the

heavier requirements for April production schedules.

Heavy snows in Ohio late in the week interfered with truck transportation of steel and automobile parts and that, as well as danger of mill interruption by floods, caused some diversion of sources of supply of stampings by motor car manufacturers who feared delay in deliveries of parts.

The Chesapeake & Ohio has placed 4300 tons of tie plates. The Nickel Plate has issued an inquiry for 777 cars. Of these, 500 will be 50-ton box cars, 200 will be 50-ton gondolas, 25 will be 70-ton gondolas, 50 will be 50-ton flat cars and 2 special 100-ton flat cars.

Bars, Plates and Shapes

Orders for bars show a substantial increase from forge shops and other makers of automobile parts. Many consumers are buying in larger lots than heretofore to ob-

tain the quantity deduction. No price announcement has been made on reinforcing bars for the second quarter. Specifications for structural shapes are coming out in good volume. While awards in this territory are scarce, those in the adjoining districts include 1875 tons for the Indianapolis post office, 1056 tons for a building for the Olds Motor Works, Lansing, Mich., and 350 tons for a Packard foundry in Detroit.

Pig Iron

Contracting for the second quarter continues in fair volume. Consumers generally are making conservative commitments and if foundry business remains at present levels many probably will have to make supplemental purchases before the end of the quarter. Shipping orders have increased as the March 31 deadline for taking iron under fourth quarter contracts approaches. Many consumers have waited about as long as they could to take out the balance of the iron due on these old low price contracts and little of this iron will remain unspecified at the end of the quarter.

Sheets

Orders for sheets for April requirements have started to come in fair volume from the motor car manufacturers who are making up their specifications so that orders for one kind, size and gage will be given to fewer mills than heretofore, thus allowing the buyer the benefit of the maximum deductions

NOPAK VALVES



An air leak equal to $\frac{1}{16}$ " diameter hole costs \$28.00 per month. Air is expensive, control it efficiently and accurately with a NOPAK valve—a patented leak-proof valve guaranteed to stay tight without maintenance. Its flat, patented disc together with a packless spindle prevents sticking and assures you of many years of leak-proof operation. Permits throttling or quick opening. Easy to operate. Seat protected at all times and cannot wear out. NOPAK valves are suitable for air, gas, water, or oil. Write for Bulletins.

Made in shut-off, three-way and four-way styles $\frac{1}{4}$ " to 2" pipe openings, three and four-way for operating single and double acting cylinders.

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INC

OHIO

under the new quantity differentials. A large volume of business in hot-rolled sheets for March shipment is coming from parts makers and other manufacturers who are crowding in their specifications to obtain advantage of the price concessions that have recently prevailed.

Strip Steel

Some small orders already have been placed for April shipment on which the new quantity differentials will apply. This means some advance over the prices that have been ruling. Not much new business is coming from the larger automobile parts makers as these, who usually buy in rather small lots of one size, have taken advantage of the recent prices and have accumulated rather large stocks.

Iron Ore

Last season's prices on Lake Superior ore are being quoted by several leading ore firms against the recent inquiry for 490,000 tons from the Ford Motor Co., which asked for bids to be submitted March 25. It may be two weeks or longer before the Ford orders are placed. Consumption of Lake Superior ore in February amounted to 2,632,306 tons, a decrease from January of 319,262 tons. This compares with 2,467,269 tons used in February last year. Furnace stocks March 1 amounted to 20,904,359 tons and stocks at furnaces and Lake Erie docks 25,808,527 tons, a decrease of 3,749,278 tons

from the same date last year. Central district furnaces in February melted 1,304,214 tons, a decrease of 178,443 tons. Lake front furnaces used 1,307,403 tons, a decrease of 139,421 tons, and all rail furnaces consumed 20,052 tons, a decrease of 1599 tons. Eastern furnaces used 637 tons of lake ore, a gain of 201 tons. There were 101 furnaces using lake ore in blast Feb. 29, an increase of two for the month.

Scrap

Interruption of steel plant operations in other districts by floods has had a depressing effect on sentiment in the scrap trade in this district and brokers are endeavoring to cover against old orders at somewhat lower prices than have been prevailing but without much success. In fact, the reductions on several steel making grades reported a week ago have tended to dry up the supply.

Steel Demand Remains Steady in South

BIRMINGHAM, March 24.—Current bookings of steel consist mostly of small routine orders. These are maintaining a steady rate. Jobbers and dealers are back in the market for sheets and wire products after the lull of January and February caused by bad weather. This business is largely in carload lots. Demand for heavy steel is irregular. Structural tonnage is ex-

pected to improve now that construction work is being speeded up.

Pig iron and steel production are unchanged, with 12 blast furnaces and 15 open-hearth in operation.

Ingalls Iron Works has booked 2000 tons of steel for the new plant of the Champion Fiber Co. at Houston, Tex.; Virginia Bridge Co., 450 tons for a bridge in Idaho and Nashville Bridge Co., an undetermined tonnage for two hangars at the Nashville, Tenn., municipal airport.

Oglebay, Norton Adds Two Vessels to Fleet

PRESSURE of the increasing demand for lake shipments of coal, coke, sand and limestone by self-unloading vessels has prompted Oglebay, Norton & Co., Hanna Building, Cleveland, to add two self-unloading steamers to the Columbia Transportation Company's fleet of 17 bulk lake vessels, according to the announcement of Crispin Oglebay, president of the two companies. The two new addi-



P. W. SHERMAN

tions are the Steamers John McCartney Kennedy and the D. E. Callender, both equipped with belt conveyor self-unloading devices of modern type. The former is a vessel of 4400 tons capacity, 374 ft. long, 48-ft. beam. The latter is of 4600 tons capacity, 366 ft. long, 48-ft. beam.

With the announcement of the addition to the Columbia Transportation Company's fleet, the appointment of P. W. Sherman as general manager of the company was made known. Mr. Sherman was with the Valley Camp Coal & Steamship Co. for 16 years, and for the past seven years has been in charge of the lake coal operations of the North American Coal Corp., Cleveland.

Floods Hamper New England Business


BOSTON, March 24.—All lines of business in New England were hampered last week by floods, especially at Springfield, Mass., and Hartford, Conn. The Moore Drop Forging Co. Springfield plant was destroyed by fire because fire apparatus could not reach the premises due to high water. Metal working and allied plants in that city, Hartford, Worcester, and in fact, at a majority of important points were forced to suspend operations. Furnace representatives endeavoring to reach points as near Boston as Fitchburg, Mass., were turned back by floods. As a result almost no pig iron business was transacted. Telephone and telegraph connections at many centers were out. Many steel bridges in Maine, Vermont and Western Massachusetts were destroyed and must be replaced at a later date.

With scrap shipments to Pennsylvania consumers held up, business centered in the export market and in nearby foundry buying of cast. Reported weakness in heavy melting steel at one Pennsylvania point is without effect here. In contrast, the export market for such material averages 25c. a ton higher, and the market for cast is firmer. Two steamers are loading here for export, and another is scheduled to arrive this morning. Providence, R. I., exporters last week finished loading 1700 tons for Scotland, whereupon the boat left for Norfolk to take additional tonnage. A barge is loading material at that point for Italy via New York.

Scrap Weaker in Buffalo District

BUFFALO, March 23.—The effect of the recent floods in the Pittsburgh district on the scrap market is problematical, but the first sign is undoubtedly a weakening of the basic price structure. Dealers are agreed that only a survey of the damage will answer the question of whether the market for old material, which has held strong over a period of several weeks and which many expected would go higher, can regain its previous strength.

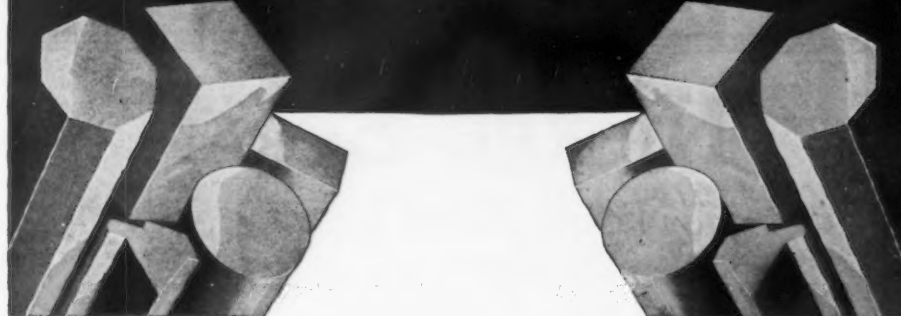
Already Youngstown, Warren and other points not affected by the flood waters are holding up shipments, suspending and canceling, leading to a softening of the



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price for scrap. Shipments of scrap into Pittsburgh are at a standstill. If a survey shows that the Pittsburgh mills can be gotten back into operation within a short time, dealers expect a resumption of demand for scrap from that source.

Total purchasing of scrap on its recent No. 1 order by the largest local consumer was about 15,000 tons. Another 2000 tons was picked up during the last week at the

same price of \$13.50. Odd carloads of short rails have been sold throughout the district at from \$16.50 to \$18.

Pig iron business is steady and producers are looking for very good business shortly. The flood has accelerated shipments and considerable rerouting has been necessary.

Open-hearth operations are unchanged for last week.

Floods Force Philadelphia Operations Down Two Points



Steeltion and Harrisburg Mills to Operate Normally in Week—Steel Purchases Fall Off, but Sharp Recovery Is Anticipated

PHILADELPHIA, March 24.—One of the smallest mills in the eastern Pennsylvania area bore the brunt of the district's flood burden. The Central Iron & Steel Co. plant at Harrisburg is completely closed down, with no melting units in operation and practically all deliveries held up. Identification marks have been washed from most of the steel; furnaces and rolling equipment require considerable repairs, and it will probably be a week before normal mill functions will be resumed in entirety. Bethlehem's Steeltion plant also was affected, no furnaces are now operating, and the company does not expect steel to be poured until the end of the week.

Improved operations at Coatesville, Sparrows Point and Bethlehem offset to a certain extent the losses at Steeltion and Harrisburg. Thus the district rate suffered only a two-point decline due to flood damage, with operations for the

week averaging about 40 per cent.

Most mills have closed books on practically all products for first quarter delivery. Even though second quarter contracts are available under a new scale of extras, very little business has developed for that period. Jobbers and some larger consumers are not loading up for the entire quarter.

Even though floods have not seriously held up steel shipments, there have been some delays. Mills are using this situation as an excuse to extend first quarter deliveries. Even though all sellers are anxious to get second quarter tonnage on their books at the new prices, the trade here believes that favored customers will be receiving steel on old contracts up to April 15.

Pig Iron

Ordering for second quarter delivery has improved, although the bulk of furnaces' business is still

of a carlot nature for nearby delivery. Even though iron sellers would like to get more tonnage on their books, they do not hold out much hope for an inrush of consumers for coverage inasmuch as the trade is apparently definitely committed to the policy of contracting only for nearby needs.

Sheets and Strip

Several mills are still taking narrow strip for rolling this week at 1.75c. and even lower, and also orders from regular customers on certain galvanized grades. Books are completely closed on hot and cold-rolled sheets and wide strip. In fact it is extremely doubtful whether orders now on books can be shipped by the end of the month. Most mills anticipate extension of deliveries for from one to two weeks into April. Little second quarter tonnage has developed so far. The E. G. Budd Mfg. Co. continues to take heavy shipments of strip from Alan Wood for fabrication into Chevrolet frames. This order will not be completely liquidated for several months. Budd has had some hold-ups on hardware due to the flood, but sheet deliveries have come along according to schedule. General autobody activity is currently as heavy as it was during the peak period late last year, and a slight advance from this level is anticipated. Within the next two weeks Budd will purchase the largest quantity of stainless strip ever involved in one order. Approximately 600 tons will be bought for constructing 48 Atchison, Topeka & Santa Fe cars. This work will start as soon as the four Burlington trains are completed.

Imports

The following iron and steel imports were received here last week: 3000 tons of chrome ore from Cuba; 2000 tons of chrome ore from Portuguese Africa; 296 tons of ferromanganese from the Netherlands, and 25 tons of pig iron from British India.

Bars, Plates and Shapes

About 250 tons of shapes and 1100 tons of reinforcing bars were awarded during the week. Very little new tonnage is up for figuring, and estimators are currently about as inactive as they have been for several years. Considerable improvement in the constructional fields is expected by mid-summer, and the rehabilitation of flood damaged areas will accelerate the movement of shapes and bars in the immediate future. Plate business has shown little snap during the past seven days. Pennsylvania Railroad has made several moder-

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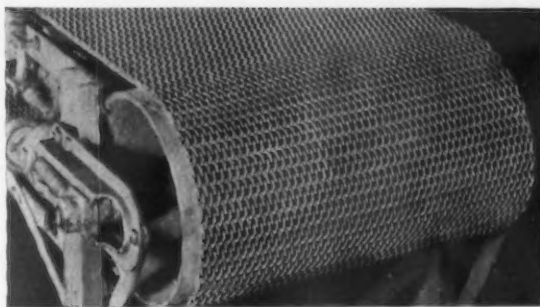
ate purchases, and Sun Shipbuilding Co. expects to order steel for several tankers during the coming fortnight. The Sun company will soon launch a Pennsylvania ferryboat and two Gulf Oil tankers. This company has six additional tankers on its books to be laid down immediately, and it is probable that two more tankers for the South African Lines will be ordered in the near future.

Scrap

There has been little change in the domestic situation. No new sales have been made and brokers are holding to their bullish position. Mills are avoiding participation in the market as long as possible. One broker continues to purchase No. 1 at Port Richmond at \$12.50. Shipments to Harrisburg are temporarily held up, but normal deliveries are going forward to Alan Wood, Worth and Coatesville. This latter mill still has about 5000 tons due it on a No. 1 order taken about six weeks ago at \$12.50. Indicative of the confidence some brokers have in the future market are the prices paid last Friday for the Southern Railroad scrap. About 4000 gondola cars, involving 35,000 tons of No. 1 steel, were up for bidding. Japanese agents offered \$11.55 a net ton, but they were overbid by a domestic bidder which took the lot at \$12.01 a net ton. This latter figure approximates \$13.46 per gross ton, which is a high price considering the fact that the scrap must be dismantled and prepared and certain valuable items such as journal boxes returned to the Southern. Probably much of this tonnage will go abroad, although some may go into the Pittsburgh area. As mentioned last week, Japan has purchased several large tonnages, one of which involved 15,000 tons at \$14 f.o.b. for second quarter delivery. Although Japan has bought close to 50,000 tons during the past three weeks, agents for that country are still dickering for additional lots. England likewise is definitely in the market for further commitments.

Detroit Scrap Prices Still Weakening

DETROIT, March 24.—The scrap market is still easing off, but it is expected that bottom will be reached in the next few weeks. The uncertainty of the requirements of mills in flooded areas is a factor, as is the apparent hold-up of purchases by Youngstown mills to force price changes.



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Pipe Lines

Steuart Brothers, Inc., Twelfth Street, N. E., Washington, oil and gasoline products, plans five new steel pipe lines for gasoline transmission from point near Thirteenth Street, S. E., to Anacostia River, where unloading and distribution facilities will be established.

Illinois Pipe Line Co., Casper, Wyo., will soon begin surveys for 8-in. welded steel pipe line from point near Lusk to Fort Laramie, Wyo., about 40 miles, for crude oil transmission. Cost close to \$200,000. Company is affiliated with Ohio Oil Co., Findlay, Ohio.

Sumner C. Bryant, San Francisco, a member of legal staff of Texas Co., Hearst Building, same city, represents a new pipe line company now being organized under State laws, to build a new welded steel pipe line from Kettleman Hills, Cal., oil field district to Estero Point, Cal., for crude oil transmission.

Panhandle Eastern Pipe Line Co., 101 West Eleventh Street, Kansas City, Mo., has let contract to National Tube Co., Pittsburgh, for 44,000 tons of 22-in. seamless steel pipe for welded steel pipe line from Zionsville, near Indianapolis, to city limits of Detroit, 235 miles, for natural gas supply to latter municipality from Amarillo, Tex., gas fields, to which point connection will be made with new line from Zionsville to Dana, Ind., terminus of present line from Texas area noted. Pipe award totals about \$3,500,000. Company has placed order with Cooper-Bessemer Corp., Mount Vernon, Ohio, for 12 1300-hp. and two 1000-hp. twin-tandem type gas-driven gas compressor units with accessories for gas booster service on new line. Gas will be distributed at Detroit by Detroit City Gas Co., which will build connecting steel pipe lines to municipal limits. Entire project will cost about \$16,000,000 and is scheduled for completion in July.

Bowdoin Natural Gas Co., Bowdoin, Mont., J. C. Boyle, secretary, will be active in construction of new welded steel pipe line from local natural gas field district to Regina and Moose Jaw, Sask., recently referred to in these columns as a project of British-American Gas Syndicate, Regina, Sask., which will be jointly interested with Bowdoin company. About 100

gas wells will be drilled and steel pipe line gathering system installed. Main line will be 185 miles long and will be used for natural gas supply for distribution in two municipalities noted. Work will begin early in spring. Cost close to \$6,000,000.

Cast Iron Pipe

Athol, Mass., will close bids April 9 on 8900 ft. of 6 to 12-in.

Needham, Mass., has awarded 110 tons of 6 to 14-in., class 150, to Warren Foundry & Pipe Corp.

Whitman, Mass., plans pipe lines for water system. Fund of \$25,000 has been authorized.

Waverly, N. Y., closes bids April 1 for pipe for water system and other waterworks installation.

Warsaw, N. Y., plans about 5000 ft. for new pipe line for water supply from reservoir at Truesdale. Financing has been arranged through Federal aid.

Lakewood, N. Y., plans early purchase of 3680 ft. of 2 and 4-in. for water system.

Beech Creek Borough, Clinton County, Pa., James A. Holter, secretary, closes bids April 7 for pipe for water system in Beech Creek Borough, Beech Creek Township, and Liberty Township, Centre County, using sand spun cast iron pipe; also for chlorinating plant and other waterworks installation. George M. Busch, Jr., 112 West Fourth Street, Williamsport, Pa., is consulting engineer.

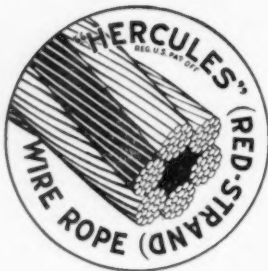
Pass Christian, Miss., has called special election April 7 to vote bonds for \$22,500 for pipe lines for water system and other waterworks installation.

Valparaiso, Ind., plans pipe lines for water system replacements and extensions. Engineer will be selected soon to make surveys.

Canton, N. C., closes bids April 1 for 21,700 ft. of 4 to 14-in. for water system; also for about 32,000 lb. of fittings, two pumping units with accessories, and other waterworks equipment. Harwood Beebe

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Co., Spartanburg, S. C., is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 31 for 10,000 ft. of 6-in. water pipe and for 60 cast iron water pipe bends (Schedule 3133).

State Commissioner of Purchases, State Capitol Building, St. Paul, Minn., asks bids until April 2 for 2½ to 8-in. for institution at Stillwater, Minn.; also for fittings, valves, etc. **G. M. Orr & Co., Baker Building, Minneapolis,** are consulting engineers.

Jackson, Wis., closes bids April 1 on new waterworks system requiring 2000 ft. of 6-in. water mains.

Kenosha, Wis., closes bids March 27 on 1500 ft. of 6-in. and 900 ft. of 4-in. class B water pipe.

Elsberry, Mo., will take bids March 30 for a waterworks system, including 450 ft. of 8 and 10-in. pipe, 150 ft. 8-in. casing, and 100,000-gal. steel tank. **Russell & Axon, St. Louis,** are engineers.

Board of Public Utilities, Kansas City, Kan., Charles A. Lowder, secretary, has rejected bids recently received for 1428 ft. of 12-in. New bids will be called soon.

Billings, Mont., has called special election April 6 to vote bonds for \$25,000 for pipe for water system at municipal airport, including water tank and other waterworks equipment. **R. T. Hurdle** is city engineer.

Pasadena, Cal., will open bids April 3 on 498 tons of 6 and 8-in.

Woodlake Public Utility District, Woodlake, Cal., has called special election April 15 to approve bonds for \$32,000 for pipe lines for water supply.

The St. Louis Purchasing Agents' Association will hold its sixth annual Members Products Exhibit at the Jefferson Hotel, St. Louis, April 16 and 17.

Freight Car Bids Being Taken on Coast

SAN FRANCISCO, March 23.—Bids for 3000 refrigerator cars for the Pacific Fruit Express Co. will be opened in San Francisco during the week. Involved in the several contracts will be 12,000 tons of plates and shapes in the underframes and 4400 tons in the bodies, 4500 tons of sheets and 8500 tons of castings in the bodies, 24,000 wheels and 12,000 axles.

The first estimates have just been completed on the structural steel tonnages involved in the eight bridges included in the plans for the relocation of Southern Pacific Co. tracks, 40 miles above Redding, Cal., on the Central Valley project. For the first bridge, to be constructed over the Sacramento River near Redding, the Southern Pacific Co. estimates 4914 tons. The aggregate for the eight structures is 20,843 tons of structural steel. The project, one of the most extensive ever undertaken, will require several years for completion and will cost \$170,000,000.

At Denver, Colo., the Bureau of Reclamation continues its purchases of material for major Western projects being developed. To date this year, the Bureau has awarded contracts for 3180 tons of reinforcing bars and 161 tons of sheet piling and has bids under advisement on 2951 tons of bars, 1308 tons of sheet piling and an unan-

nounced tonnage of structural steel and plates.

Steel Pipe & Tank Co. is low bidder at Tacoma, Wash., on the contract for 48-in. steel pipe which will involve 2050 tons of plates. On the alternate for lock joint concrete pipe, American Concrete & Steel Pipe Co. is low. Approximately 900 tons of rods, 400 tons of sheets and 250 tons of plates will be required under this alternate.

Mill operations on the Coast are reported to be at a higher rate than at any time since 1931. Industrial demand, school reconstruction, reclamation work and projects stimulated by Federal aid are responsible for the tremendous improvement.

The 20,843 of structural steel involved in the eight bridges included in the plans for the relocation of the Southern Pacific tracks on the Central Valley project will be used as follows: Sacramento River bridge near Autler, 2252 tons; Salt Creek bridge near Pollock, 1711 tons; Doney Creek bridge, 762 tons; Fifth Delta crossing over Sacramento River, 180 tons; Fourth Delta crossing over Sacramento River, 594 tons; O'Brien Creek bridge near Elmore, 2430 tons; Sacramento River bridge near Redding, 4914 tons, and Pitt River bridge, 8000 tons.

Niles and General Machinery to Merge

STOCKHOLDERS of the General Machinery Corp., Hamilton, Ohio, will meet, April 20, to vote on the proposed merger of the concern with the Niles-Bement-Pond Co., New York. Shareholders of the latter corporation will meet the following day to complete the agreement.

Both companies have been connected closely since 1928, when General Machinery gave Niles-Bement-Pond more than 50,000 shares of common stock and \$375,000 in cash and other assets for holdings in Niles Tool Works Co., and the Niles Gear Co., both of Hamilton.

Plans call for an exchange of stock in the new company. Common shareholders of General Machinery will receive share-for-share, and preferred stockholders will be given 1.05 shares of \$4.50 convertible, preferred, for each share of 7 per cent preferred. Niles-Bement-Pond common holders will be given two shares for each share held. There also will be issued 7866 shares of new preferred to provide additional capital.

New York Steel Demand Is Maintained Despite Floods



Delayed Deliveries Inconvenience Customers Slightly, but Little Business Is Diverted Elsewhere—Construction Releases Heavy

NEW YORK, March 24.—Despite serious flood damage in nearby Connecticut and New Jersey, aggregate demand for finished steel products in the Metropolitan district has been well maintained during the past week. Although mills in the Pittsburgh and Wheeling districts have been unable to make deliveries, New York sales offices have now established normal connections with their headquarters and delayed shipments are already going forward.

Warehouse stocks are being drawn upon heavily in some cases, but on products such as pipe, normal supplies have been more than adequate. Structural steel, reinforcing bars and some grades of sheets can also be shipped out of warehouse for most purposes and it is safe to say that no steel consumers in this district have been inconvenienced by flood conditions. A few users in lower New England and New Jersey have been forced to hold up shipments, but releases are expected to be forthcoming this week.

While current demand for steel is fairly well distributed, definite improvement has been registered in releases of construction materials. Outdoor work seems to be getting under way rapidly and it is now estimated that many thousand tons of steel will be required for bridges and other flood rehabilitation jobs. Railroad buying will unquestionably be augmented. Currently, the carriers are not active in this market.

The new second quarter prices, with accompanying quantity differentials on sheets, strip and bars, have not yet been tested. Delays in shipments due to the floods will also force mills to extend deliveries on old contracts into the first half of April. However, no new business is now being booked at first quarter levels and old orders will certainly be cleaned up by April 15.

Pig Iron

Generally dull selling conditions prevail, as foundry operations have been retarded by flood damages. Actual property damage in this area fortunately has been slight, but certain northern New Jersey yards are not yet clear of sediment and debris deposited by flood waters, while foundries generally report shipments to outlying customers affected. The trend of operations is downward since two weeks ago. In Brooklyn conditions are spotty. Some establishments report relatively good business, but others continue on a two to three-day working basis. One northern New Jersey firm closed for 1000 tons during the past week, though this was an exceptional occurrence. Inquiry for heavy lots in the majority of cases has not crystallized

into orders. Insistence upon price concessions is principally the cause.

Reinforcing Steel

Bids were taken last week on only 143 tons of the 1000 tons reported opened by the New Jersey highway department. The rest of the jobs were not included because of the diversion of funds from the highway program to other projects. The largest award last week was 690 tons, to W. S. Ames & Co., Jersey City, through the procurement division of the Treasury Department. The low bid on 180 tons for stadiums in Jersey City and Union City was reported to be \$2.25 a 100 lb., including size extras, engineers and supervisors furnished at the job, cutting to lengths and delivered. Another Treasury Department job, New York procurement division, of 166 tons is in doubt since the low bid was about \$5,000 below the next lowest bidder and is thought to have been in error. Prices are fair in most sectors, but some rather heavy cutting is reported in this district.

Scrap

Mixed factors in this market continue to confuse the true status of both the export and domestic situations. In view of the unusual export activity of the past several weeks, this phase of the market occupies a prominent position. Japan has purchased almost 60,000 tons of steel-making grades, mostly for

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delivery over the next four months and mostly at prices varying between \$13.25 and \$14, f.o.b. So far no other country has seen fit to match Japan's activities; Italy refuses to buy at these prices; England is holding aloof, and other foreign melters occupy their time entering bids they know brokers won't accept. Although Japanese interests intimate that additional orders are in the offing, it is believed here that the whole price

structure is due for a moderate revision downward. What actually will ensue will depend to some extent on domestic interest during the next fortnight. Currently, there is a moderate flow of steel into eastern Pennsylvania, but the entire market is perceptibly holding back until a mill purchase in that area establishes a market trend. Most sellers look forward to a test sale of this nature during the next 10 days.

Great Lakes Steel Begins Operating Of Country's Largest Continuous Mill

DETROIT, March 24. — Rolls were turned over for the first time yesterday on the world's largest continuous hot and cold strip sheet mill in the plant of the Great Lakes Steel Corp., Ecorse, Mich. The mill, technically known as a 96-in. mill because of the overall width of its rolls, will produce hot strip and sheets up to a width of 90 in., the widest in the history of the steel industry. After a few minor adjustments made during test runs, officials stated that the new mill was in perfect running order and that commercial production would be started immediately.

The 96-in. mill is part of a general expansion program now in progress at Great Lakes Steel Corp. With the hot mill in operation, the cold mills are expected to

go into production in about a month, at which time the new mill will have an estimated capacity in excess of 60,000 tons of flat-rolled steel per month.

Also under construction are four 250-ton open-hearth furnaces with soaking pits and other auxiliary equipment which will be completed in October. The new furnaces will increase the ingot capacity of Great Lakes to approximately 1,500,000 tons a year.

According to George R. Fink, president of the company, the new mill was constructed not only to meet the increased needs of many manufacturing concerns for wider strip and sheets, but also to fulfill the exacting demands of the automobile industry for higher and higher quality. Wider sheets make

it possible to effect savings in production costs, and also open the way to improved operating procedures that are impossible with the narrower widths. The strip and sheets produced by the new hot mill can be used in products where highly finished steel is not required, such as storage tanks, barrels, piling, railroad cars, parts of automobile frames and wheels, and many others. The cold rolls will turn out the high finished steel that is required for automobile bodies and fenders, refrigerators, stoves, furniture and other products in which there is a similar application for sheets and strip.

The new mill will practically double the company's flat-rolled capacity and present facilities for the production of merchant bars, forging bars and billets; and special rolled sections will enable Great Lakes to meet the requirements of users of these products in all major steel-consuming centers.

Six new buildings, covering an area of more than 800,000 sq. ft., were erected to house the 96-in. mill. The raw materials for the mill in the form of slabs are brought on an electric railroad from the steel mill proper, placed in furnaces, and heated to the proper temperature for rolling. Each slab weighs about 7000 lb., is 4½ in. thick, up to 48 in. wide, and 15 ft. long. The hot slab is dumped upon a conveyor which carries it to the first of a series of 10 four-high rolls, standing in tandem. Four of these roll stands are for roughing, and six are for finishing processes. The thickness of the slab is successively reduced as it passes through the rolls and finally it comes out upon the end conveyor a wide ribbon of steel in sheet gages.

The distance from the reheating furnaces to the end of the conveyor is more than 1600 ft. After passing through the final stand of rolls, the strip can either be cut to length on the mill or wound into a coil. The cut-to-length steel is shipped as hot strip material. The coils of steel are delivered by an underground conveyor to the coil storage room, and from there go through a continuous pickler which removes scale and other impurities from the surface of the metal. From this process, the coil is passed through one of two tandem cold mills which reduce it to the required sheet gages.

Great Lakes Steel Corp. is a division of National Steel Corp., which also owns and operates the Weirton Steel Co., The Hanna Iron Ore Co., the Hanna Furnace Corp., and the Producers Steamship Co.



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Fabricated Structural Steel

Lettings Decline—New Projects Lower

AMONG awards of 15,150 tons, which compare with 31,750 tons last week, the only bookings of size are 1875 tons for a post office in Indianapolis, 1750 tons for the Twenty-third Street bridge in Kansas City, Mo., and 1200 tons each for a plant building for Lever Brothers, Hammond, Ind., and five schools in Philadelphia. New projects of 12,200 tons compare with 19,525 tons in the previous week and 18,000 tons two weeks ago. The outstanding new job reported is 6500 tons for the Sixth Avenue subway in New York. Plate lettings of 8530 tons include 8100 tons for a 60-in. pressure main in St. Louis. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Hopkinton, N. H., 150 tons, bridge, to Bethlehem Steel Corp.; previously reported to Kittridge Bridge Co.

Kingston, R. I., 120 tons, bridge, to Bethlehem Steel Corp.

New York, 210 tons, Mother Cabrini hospital, to Schact Iron Works.

New York, 220 tons, bath house, 145th Street, to Belmont Iron Works.

New York, 370 tons, New York Central bridge, 184th Street and Fordham Road, to Ingalls Iron Works Co.

Brooklyn, 360 tons, factory building, 255 McKibben Street, to Simon Holland & Son, Inc.

Clymer, N. Y., 155 tons, Pennsylvania Railroad bridge, to Phoenix Bridge Co.

Rome, N. Y., 100 tons, post office, to Utica Steam Engine & Boiler Works.

Newark, N. J., 210 tons, Ballentine warehouse, to H. R. Goeller, Inc.

Philadelphia, 1200 tons, five schools, to Fort Pitt Bridge Works Co.

Wilmington, Del., 135 tons, garage, to Morris, Wheeler & Co.

SOUTH AND SOUTHWEST

Montgomery County, Miss., 136 tons, bridge, to Virginia Bridge Co.

Covington-Forrest Counties, Miss., 105 tons, bridge, to Nashville Bridge Co.

Lee County, Miss., 115 tons, bridge, to Vincennes Steel Co.

Red River County, Tex., 120 tons, underpass, to Austin Brothers Bridge Co.

Otero County, New Mex., 111 tons, State bridge near Tularosa, to an unnamed bidder.

CENTRAL STATES

Hammond, Ind., 1200 tons, soap plant for Lever Brothers, to Wisconsin Bridge & Iron Co.

Indianapolis, 1875 tons, post office, to Bethlehem Steel Corp.

Lansing, Mich., 1065 tons, engineering building, Olds Motor Works, to R. C. Mahon Co.

Detroit, 360 tons, foundry for Packard Motor Co., to Whitehead & Kales, Inc.

Detroit, 115 tons, office building for Singer Sewing Machine Co., to R. C. Mahon Co.

Grand Rapids, Mich., 380 tons, S. S. Kresge store, to R. C. Mahon Co.

Shawano County, Wis., 275 tons, bridge, to Wisconsin Bridge & Iron Co.

Green County, Ill., 175 tons, highway bridge, to Fort Pitt Bridge Works Co.

Armington, Ill., 260 tons, bridge, to Vincennes Bridge Co.

Shepherd, Ill., 430 tons, bridge, to Clinton Bridge Works.

Wabash County, Ill., 130 tons, highway work, to Mississippi Valley Structural Steel Co.

St. Clair County, Ill., 315 tons, highway work, to Mississippi Valley Structural Steel Co.

Alton, Ill., 365 tons, warehouse addition, to Rogers Structural Steel Co.

Brown County, Kan., 145 tons, bridge, to St. Joseph Structural Steel Co.

Norton County, Kan., 270 tons, bridge, to Omaha Steel Works.

Russell County, Kan., 215 tons, to Missouri Valley Bridge & Iron.

Kansas City, Mo., 1750 tons, Twenty-third Street viaduct, to Wisconsin Bridge & Iron Co.

St. Louis County, Mo., 265 tons, bridge, to Stupp Brothers Bridge & Iron Co.

Cowley County, Kan., 425 tons, to Kansas City Structural Steel Co.

WESTERN STATES

Lewis and Clark County, Mont., 159 tons, State bridge, to American Bridge Co.

Montrose County, Colo., 150 tons, State bridge, to Minneapolis Moline Power Implement Co.

Mountain City, Nev., 221 tons, concentrator for International Smelting & Refining Co., to Worden-Allen Co.

Los Angeles, 150 tons, tunnel ribs for Metropolitan Water District, Specification No. 146, to Commercial Shearing & Stamping Co.

Los Angeles, 160 tons, Narbonne high school, to Bethlehem Steel Corp.

Seattle, 315 tons, State building, to Wallace Bridge & Structural Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 6500 tons, section of Sixth Avenue subway; bids April 14.

SOUTH AND SOUTHWEST

State of Texas, 625 tons, highway bridges.

Yuma, Ariz., 672 tons, railroad bridge and Araz Wash overchute on All-American Canal; bids April 16.

CENTRAL STATES

Lorain, Ohio, 1300 tons, Black River bridge; Holmes Construction Co., Wooster, Ohio, general contractor.

State of Illinois, 1375 tons, highway bridges.

St. Louis, 1000 tons, superstructure for municipal bridge approach; C. E. Smith & Co., St. Louis, engineers; bids April 10.

WESTERN STATES

Reno, Nev., 212 tons, State underpass; bids April 15.

Winnemucca, Nev., 222 tons, State bridge and overpass; bids April 8.

Platt County, Wyo., 143 tons, State overhead crossing; bids March 26.

Granger, Wyo., 101 tons, State underpass and approaches; bids March 26.

FABRICATED PLATES

AWARDS

Collegeville, Pa., 130 tons, 200,000-gal. tank, to Pittsburgh-Des Moines Steel Co.

St. Louis, 8100 tons, 60-in. pressure main, to Bethlehem Steel Corp.

Sheboygan, Wis., 125 tons, pressure gas holder, sewerage system, to Chicago Bridge & Iron Works.

Mare Island, Cal., 175 tons, hull plates, Specification No. 7217, to an unnamed bidder.

NEW PROJECTS

Fort Peck, Mont., 7350 tons, lining for Tunnel No. 1 on Fort Peck Dam; bids April 20 at Kansas City.

SHEET PILING

AWARDS

Cleveland, 700 tons, dock improvements for Republic Steel Corp., to Bethlehem Steel Co.

NEW PROJECTS

Denver, 1308 tons, material for All-American project under five specifications; bids opened by Bureau of Reclamation.

Railroad Equipment

Seaboard Air Line is asking for 125 70-ton phosphate cars.

Delaware & Hudson will build 50 50-ton composite hopper cars in shops at Oneonta, N. Y., and will rebuild 100 coal cars.

Erie is inquiring for 500 box cars and 300 automobile cars of 50 tons capacity, 100 automobile cars to be equipped with loaders.

Pacific Car & Foundry Co. has received orders for 75 50-ton logging cars from Weyerhaeuser Timber Co.

General American Transportation Corp. has received orders from Charles Lennig & Co., Inc., Philadelphia, for one 50-ton and one 30-ton tank cars.

H. K. Porter Co. will build one 73-ton 6-wheel fireless steam locomotive for Great Lakes Steel Corp., Detroit. Timken roller bearings will be used on driving axles.

American Car & Foundry Motors Co. has received following orders for motor coaches: Des Moines Railway, two H-13-S coaches; Worcester Street Railway, three H-9-S coaches; Boston, Worcester & New York Street Railway, two H-15-S coaches, and one H-9-S coach.

RAILS

St. Louis is asking bids until April 10 on 600 tons of 100-lb. rails for use on St. Louis municipal bridge.

United Engineering & Foundry Co., together with Timken Roller Bearing Co. of Canton, Ohio, have produced two new 16-mm. sound-on-film moving pictures, one of which shows the new 43-in. four-high hot continuous strip mill of the Carnegie-Illinois Steel Corp. The other film shows the new 56-in. four-high hot and cold strip mills of the Ford Motor Co., Detroit. The latter picture covers the operations of the blooming mill, the four-high hot strip mill, the three-stand tandem cold strip mill, and the two-high roller bearing planishing mills. These moving pictures are available for public showing.

Domestic Stocks of Lead Increase By 1000 Tons During February

Flood Damage to Electrical Equipment Promises Greater Demand for
Copper—Large Tin Consumers Out of the Market—Zinc
Quiet, but Price Is Firm

NEW YORK, March 24.—Damage to plant and electrical equipment caused by flood waters is expected to affect copper consumption favorably within a short time, but as yet demand has not benefited from this incident. Yesterday's sales in the domestic market were 1283 tons, and the month's total is now 25,776 tons, an increase of approximately 10,000 tons since a week ago. Although not featured by large-scale buying, the market has displayed an encouraging steadiness for quite some time. Most interested observers agree that forward prospects are even brighter, with the possibility at all times present that a heavier buying trend will establish prices

uniformly higher. Present quotations reveal no change from the 9.25c. a lb. basis. Two large sellers, who continue to quote 9.50c., are out of the market. The more complacent attitude with which foreign business views the political scene in Europe is responsible for a steadier London market. The price of electrolytic copper in London today is reported at 9.02½c. a lb.

Tin

The largest users were out of the market last week as a result of flood conditions, but demand from other sources accounted for a moderate business. Prices reacted to the disturbed industrial situation by tapering slightly down-

ward. Since a week ago today a loss of ½c. a lb. has occurred in the New York quotation on spot Straits metal. Today's price accordingly is 47.75c. a lb. At London standard quotations have likewise receded, with this morning's spot level at £212 10s. and futures at £204 15s. The Eastern price was slightly lower at £210 10s. A resumption of operations by tin plate producers as spring business gathers momentum and flood obstacles are overcome should provide a larger outlet for tin in the near future. Current buying tendencies by less important interests are distributed unevenly over forward months.

According to the March issue of the Bulletin of the International Research and Development Council, a tendency is developing for consumer stocks to increase. In the year ended January, 1936, such stocks were increased by 4300 tons, but in the year ended January, 1935, they were depleted by 11,500 tons.

Lead

A prolonged period of heavy lead buying has at length resulted in a more quiet market from the standpoint of new demand. Producers, however, consider themselves favorably situated, as they are quite heavily booked ahead for April and May books are scheduled for opening next week. Last week's sales, it is estimated, fell considerably below 5000 tons; but the price is entirely firm at 4.60c. a lb., the reduction in sales having been a consequence of previous large-scale commitments.

February statistics revealed that stocks of refined lead in this country increased 997 tons to 225,010 tons at the month's close. Production dropped 2169 tons to 34,127 tons, but shipments, which declined 1504 tons from the January figure, were slightly under production at 33,086 tons. However, in view of the immense stocks of 225,000 tons, February's slight gain was of little consequence.

Zinc

This market is quiet and unchanged from earlier weeks. Prime Western sales last week were 1273 tons, and sales of Brass Special, 100 tons. Forward sales declined 2967 tons to 47,092 tons by the week's end. Flood conditions affected the market unfavorably to the extent that galvanizing capacity in certain sections of the country was inundated. Ordinarily at this season of the year galvanizing operations are in their ascendancy. The domestic price for zinc is firm at 4.90c. a lb., while ore prices are unchanged at \$31 and \$32 a ton.

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 18	Mar. 19	Mar. 20	Mar. 21	Mar. 23	Mar. 24
Electrolytic copper, Conn.*.....	9.25	9.25	9.25	9.25	9.25	9.25
Lake copper, N. Y.....	9.37½	9.37½	9.37½	9.37½	9.37½	9.37½
Straits tin, Spot, New York.....	48.25	48.12½	47.87½	.....	47.87½	47.75
Zinc, East St. Louis.....	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York.....	5.27½	5.27½	5.27½	5.27½	5.27½	5.27½
Lead, St. Louis.....	4.45	4.45	4.45	4.45	4.45	4.45
Lead, New York.....	4.60	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-21.00c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.50c. a lb., New York.
Quicksilver, \$77.00 to \$79.00 per flask.
Brass ingots, commercial 85-5-5-5, 9.25c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.....	49.25c. to 50.25c.
Tin, bar.....	51.25c. to 52.25c.
Copper, Lake.....	10.25c. to 11.25c.
Copper, electrolytic.....	10.25c. to 11.25c.
Copper, castings.....	10.00c. to 11.00c.
*Copper sheets, hot-rolled.....	16.50c.
*High brass sheets.....	14.62½c.
*Seamless brass tubes.....	16.87½c.
*Seamless copper tubes.....	17.00c.
*Brass rods.....	13.12½c.
Zinc, slabs.....	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.....	10.25c.
Lead, American pig.....	5.10c. to 6.10c.
Lead, bar.....	6.10c. to 7.10c.
Lead, Sheets, cut.....	8.25c.
Antimony, Asiatic.....	14.00c. to 15.00c.
Alum., virgin, 99 per cent, pus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.50c. to 20.00c.
Solder, ½ and ½.....	29.50c. to 30.50c.
Babbitt metal, commercial grades.....	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	51.87½c.
Tin, bar.....	53.87½c.

Copper, Lake.....	10.25c. to 10.50c.
Copper, electrolytic.....	10.25c. to 10.50c.
Copper, castings.....	10.00c. to 10.25c.
Zinc, slabs.....	6.50c. to 6.75c.
Lead, American pig.....	5.20c. to 6.50c.
Lead, bar.....	8.50c.
Antimony, Asiatic.....	16.50c.
Babbitt metal, medium grade.....	19.00c.
Babbitt metal, high grade.....	55.87½c.
Solder, ½ and ½.....	27.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	7.25c.	8.00c.
Copper, hvy. and wire.....	7.12½c.	7.62½c.
Copper, light and bottoms.....	6.12½c.	6.62½c.
Brass, heavy.....	4.00c.	4.62½c.
Brass, light.....	3.25c.	4.00c.
Hvy. machine composition.....	6.00c.	6.50c.
No. 1 yel. brass turnings.....	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings.....	5.62½c.	6.12½c.
Lead, heavy.....	3.50c.	3.87½c.
Zinc.....	2.50c.	2.87½c.
Cast aluminum.....	12.12½c.	13.25c.
Sheet aluminum.....	13.25c.	14.75c.

"It Can't Happen Here"

(CONCLUDED FROM PAGE 37)

cians who when holding office parade in picket lines; union boycotts, radicalism in city and other governments, tax free plants, gifts of sites and plants, guarantee against labor trouble, cooperation from city governments, remodeling vacant factories, etc. In fact about every practical inducement that has an alluring appeal to a harassed manufacturer.

And, by the way a manufacturer looking for greener pastures may also consider Canada, where as one employer has stated, "... the policy seems to be one of welcoming industry. We are not looked upon as pirates there because the government recognizes industry pays taxes and provides employment."

In the face of the many obstacles thrown in their way, many Wisconsin manufacturers are bravely carrying on and are waiting for the inevitable change of attitude. The Milwaukee *Sentinel* has run a series of educational articles that has awakened thousands of voters to the true state of affairs. In the meantime one employer has paid a 3 per cent bonus to all office and shop employees. Another has announced a plant addition as a mark of appreciation to its loyal employees. Employers would go much farther if unhampered.

The Worm Is Turning

Some of the favorable signs that are breaking are that a communistic leader has been given six months in jail for criminal libeling a chief of police. Damage suits against Kohler Company have been dropped. In an attempt to settle a strike books and costs were shown to a former executive of the NRA board who refused to consider them. Later the labor group offered to cut labor costs 25 per cent if the manufacturer would stay in Wisconsin. Negotiations had by them progressed so far that the compromise was of no avail.

The important thing is not the mess in which Wisconsin finds itself nor the advantage which has been accruing to out-of-state communities. The matter of greatest moment is that manufacturers and intelligent voters in other states

profit by the experience of Wisconsin. They should guard against the beginning of industrial strangulation and discouragement. Regulation should not be one-sided. Keep legislation on a high and unprejudiced plane. Preserve law and order and maintain peace by subduing lawlessness. Maintain the right to work as well as the right to strike. Guarantee the citizen his constitutional rights of freedom to come and to go at his will. These are certainly the prime responsibilities of good and honest government.

The most effective way to attainment is to arouse all honest citizens to the dangers which lie ahead; take the selection of candidates for public office out of the hands of tricky political groups. Make a determined effort to select men who are level headed, free from prejudice and who will place community interest ahead of personal political gain. A type of office seeker to avoid is the man who appears to have all qualifications but lacks the backbone to face a screeching minority and who is too cowardly to take the action which he knows is right.

The problem simmers down to placing the welfare of a people and a state above the present sub-grade level of politics; of keeping guinea pig experimentation within strict and sane limits.

This Water Wheel Did Business When Grandpa Was a Boy

(CONCLUDED FROM PAGE 39)

ped with a 20-ft. diameter flywheel. Through bevel gears, shafting and leather belts, the power was finally distributed to the entire works.

As the power was taken off at the periphery of the wheel, the main journals had only to care for wheel weight, water weight and gear thrust. The wheel alone in a water soaked condition is estimated to have weighed 250 tons. The shape of the wheel naturally de-

termined the shape of the 56-ft. 4-in. gears. It seems quite remarkable that such an immense, revolving structure could have been maintained sufficiently round to insure the proper meshing of the gears. From conversations with several men who worked at the old plant, it appears that no such difficulty was encountered.

Trade Notes

Roots-Connersville Blower Corp., Connersville, Ind., has located its Chicago branch office in Marquette Building, 140 South Dearborn Street. William Townsend is district manager, assisted by James T. Sutliff.

Hutton H. Healey & Associates, 2832 East Grand Boulevard, Detroit, have been appointed exclusive agents in the Detroit territory for the sale of Kling Heavy Duty Grinders by Bryant Machinery & Engineering Co., Chicago, national distributors for this line.

Michael Peck & Sons, structural and ornamental iron works, Newark, N. J., have moved from 685 South Sixteenth Street, to 14-16 Buffington Street.

Link-Belt Co., Chicago, reports 1935 consolidated net income of \$1,092,362, equal to \$1.29 a share on the common stock. This compares with net income of \$869,373, or 94 cents a share in 1934.

Meter Devices Co., Canton, Ohio, has appointed Frank P. Withers, 2022 Chase Avenue, Chicago, as representative in Illinois, eastern Wisconsin and northern Indiana, and L. B. Graves, 808 LaSalle Avenue, Minneapolis, Minn., as representative in Minnesota, North and South Dakota and western Wisconsin.

Canadian Industries, Ltd., 1050 Beaver Hall Hills, Montreal, manufacturer of industrial chemicals, etc., plans new works at Shawinigan Falls, Que., for production of chemical solvents. Work is scheduled to begin in May. Cost close to \$100,000 with equipment.

Pratt Industries, Inc., has taken over entire business of Pratt Chuck Co., Frankfort, N. Y., and will operate from the same offices and plant. Winthrop T. Scarritt is president and treasurer of new organization; George Sicard, vice-president and director of sales; Alexander Pirnie, secretary.

Diamond Tool Co., 4059 South Ellis Avenue, Chicago, has recently opened service branches in Buffalo and Pittsburgh, and will open an office in Cincinnati shortly.

George P. Schumacker, formerly with Worthington Pump & Machinery Corp., is now located at 1120 Chester Avenue, Cleveland, and represents Cooling Tower Co., Inc., Pennsylvania Pump & Compressor Co., Stets Co., V. D. Anderson Co., Williams Valve Co., Sea-Ro Packing Co. and Mabbs Hydraulic Packing Co.



Plant Expansion and Equipment Buying

War Preparation Abroad Felt in Machine Tool Demand

DEMAND for machine tools this week, though unspectacular, is unabatedly steady. Analysis of bookings, each week, reveals minor fluctuations in individual types, but the market average is improving moderately. As in all periods of buying change, heavy tools are lagging behind the less expensive lighter machines. Drilling machinery dipped slightly, the past week, but the slack was offset by small increase in lathe and milling machine demand. Scandinavian countries, for the first time in recent months, were in the market for retooling airplane plants. Other foreign business reflects interest in war and munitions preparation.

◀ NORTH ATLANTIC ▶

American Can Co., 230 Park Avenue, New York, has let general contract to Davis Construction Co., 9 West Chase Street, Baltimore, for one-story addition, 70 x 70 ft., to branch plant on Hudson Street, Baltimore. Cost close to \$50,000 with equipment.

New York Central Railroad Co., 466 Lexington Avenue, New York, C. C. Warne, purchasing agent, asks bids until March 30 for wire nails, tubes, pipe, axles, etc. (Contract No. 4-1936).

Texas Co., 135 East Forty-second Street, New York, plans early rebuilding of part of storage and distributing plant at Birmingham, recently destroyed by fire. Loss about \$50,000 with steel tanks, pumping machinery and other equipment.

Sailors Snug Harbor, 262 Greene Street, New York, plans new electric power plant. Cost close to \$50,000 with equipment. Corbett & MacMurray, 130 West Forty-second Street, are architects and engineers.

Jamaica Stove Supply Co., 168-09 Jamaica Avenue, Jamaica, L. I., has acquired adjoining property, 56 x 100 ft., for one-story addition. Cost about \$40,000 with equipment.

B. Schwanda & Sons, 79 Madison Avenue, New York, manufacturers of metal buckles, slides, etc., have let general contract to Samuel Nowell, Denton, Md., for one-story plant at Denton, 80 x 100 ft. Cost about \$50,000 with equipment.

Robins Dry Dock & Repair Co., Erie Basin, Brooklyn, plans rebuilding joiner and pattern shops recently destroyed by fire. Loss over \$35,000 with equipment. Company is operated by Todd Shipyards Corp., 25 Broadway, New York.

United States Engineer Office, First District, New York, asks bids until March 31 for 12 cast steel gates for dredge units (Circular 341).

Regional Market Authority, City Hall,

Albany, N. Y., plans installation of a refrigerating plant and system, conveyors, loaders and other mechanical equipment in new market building for which site is being secured. Cost over \$275,000 with equipment. Bond issue is being arranged. J. J. McManus, address noted, is architect in charge.

D. Brown Co., Inc., 5312 New Utrecht Avenue, Brooklyn, tin-smithing and roofing supplies, equipment, etc., has filed plans for two-story building, 100 x 100 ft., at Woodhaven, Queens, for factory branch, storage and distributing plant. Cost close to \$40,000 with equipment. Abraham Farber, 105 Court Street, Brooklyn, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 31 for four motor-driven radial drills (Schedule 7468), 1000 acetylene regulators, 1100 oxygen regulators and 70 hydrogen regulators (Schedule 7460) for Brooklyn Navy Yard; until April 7, 17,600 ft. of bronze steam hose (Schedule 7466) for Brooklyn and Mare Island yards.

Quartermaster, West Point, N. Y., asks bids until March 30 for one electric drying oven, and one oil-drying and purifying equipment (Circular 103).

Borough Council, New Providence, N. J., Thomas C. Musson, borough clerk, asks bids until March 31 for pumping machinery and auxiliary equipment, sludge-handling, screening, purifying and other equipment for new sewage treatment plant. Clyde Potts, 30 Church Street, New York, is consulting engineer.

Magnetic Pigment Co., 601 Cass Avenue, Trenton, N. J., manufacturer of iron oxide, industrial chemicals, etc., has acquired plant of Consolidated Chemical Co., Monmouth Junction, now in receivership, and will occupy for expansion. Improvements will be made. Purchasing company is an interest of Columbian Carbon Co., 45 East Forty-second Street, New York.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia,

asks bids until April 1 for one punch and die, complete (Circular 392); until April 10, one complete unit for milling 1000 mechanical time fuses per 8-hr. day (Circular 380).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 31 for six pneumatic tapping machines (Schedule 7452), 24 3-ton and 12 1-ton chain hoists (Schedule 7453), one motor-driven bending brake (Schedule 7454) for Philadelphia Navy Yard; 24 pneumatic chipping hammers, six pneumatic reversible drills, eight pneumatic grinders (Schedule 7432) for Philadelphia, Eastern and Western yards.

◀ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 31 for air compressor sets and spare parts (Schedule 7423), 12 450-ft. lengths marker buoy chain (Schedule 7418), cone joint fittings for small tubing (Schedule 7428) for Portsmouth, N. H., and Mare Island navy yards.

Dewey & Almy Chemical Co., 235 Harvey Street, Cambridge, Mass., has asked bids on general contract for two-story and basement addition, 55 x 145 ft. Cost over \$100,000 with equipment. H. L. Kennedy is company engineer in charge.

P. Ballantine & Sons, 57 Freeman Street, Newark, N. J., brewers, will soon take bids for new one-story storage and distributing plant, 100 x 150 ft., at Hamden, Conn. Cost over \$50,000 with conveying, loading and other equipment. Joseph S. Shanley, 33 Washington Street, Newark, is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until April 6 for one portable paint-spraying machine with accessories (Circular 166), one vertical wood borer (Circular 170), one speed lathe (Circular 176); until April 7, one jig boring machine (Circular 165), two 12-in. motor-driven shapers (Circular 168), two 24-in. motor-driven shapers (Circular 169); until April 8, one portable, flexible shaft rotary filing machine (Circular 173), one high-speed steel electric furnace (Circular 167), one motor-driven, self-contained, anti-friction bearing, high-speed, straight-line cut-off saw (Circular 172); until April 9, two centrifugal oil extractors (Circular 181), one bench, flexible shaft, rotary filing machine (Circular 178).

State Procurement Officer, Treasury Department, 1044 Chapel Street, New Haven, Conn., asks bids until March 31 for two Diesel engine electric generating plants (Proposal 2-30-229).

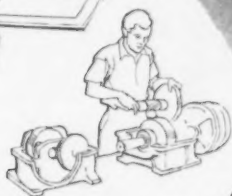
◀ BUFFALO DISTRICT ▶

A. J. Brandt, Inc., 7300 Woodward Avenue, Detroit, engineer, associated with automobile-manufacturing interests, has arranged for purchase of plant of Franklin Automobile Co., 302 South Geddes Street,

DESIGNED..

BUILT..

TESTED... AS A UNIT

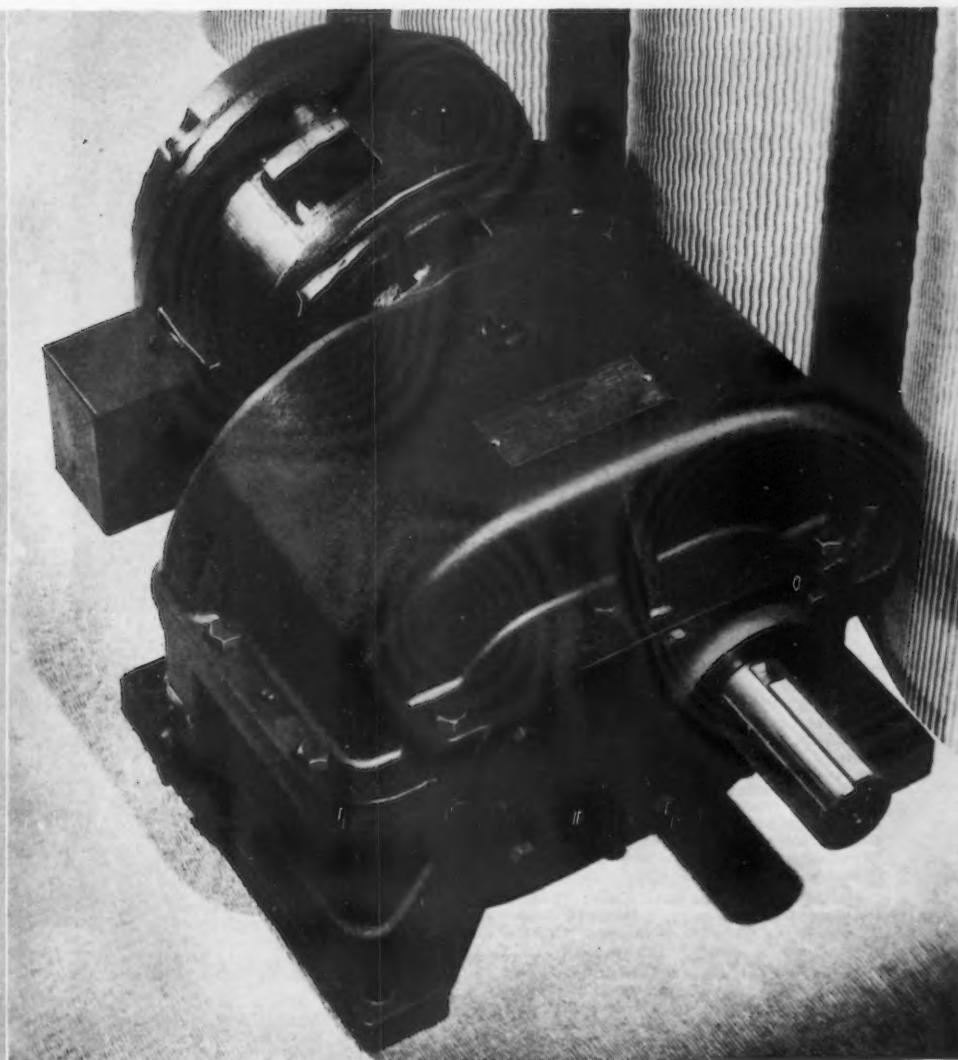


PLUS VALUE

NO. 1

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1. Built, designed, tested as a unit.
2. Motor and gearing parts are matched.
3. BPT heat treated gears, pinions and shafts.
4. Fewest moving & wearing parts.
5. Readily accessible for inspection or maintenance.
6. No sag or twist in motor frame.
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8. Gears cut on shaft.
9. Positive oil seal.
10. Single helical gearing.



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The integral design of Westinghouse gearmotors reduces wearing parts to a minimum, permitting more compact design and assuring permanent alignment of the gearmotor parts. In addition, since Westinghouse makes both gear and motor you are assured of an undivided responsibility, plus an undivided attention to the details that spell

long, trouble-free operation in service.

A typical double reduction gearmotor saves 25% in length, 30% in width, 50% in height, and 35% in weight over a motor and speed reducer of the same capacity. Westinghouse gearmotors offer all these advantages and in addition provide plus value at every point from the motor terminal to the slow speed shaft.

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MOST COMPREHENSIVE LINE OF CRANES & HOISTS

Syracuse, N. Y., defunct, and will take immediate possession. Plant will be re-modeled and additional equipment installed for production of automobiles, including parts manufacture and assembling. Alfred R. Glancy, Bloomfield Hills, Mich., formerly a vice-president of General Motors Corp., identified with Oakland Automobile Division, is associated in new enterprise at Syracuse.

United States Engineer Office, Federal Building, Buffalo, asks bids until March 31 for 3/4-in. diameter wire rope (Circular 104).

Maloney Coal Co., 803 Niagara Street, Niagara Falls, N. Y., plans early rebuilding of coal loading, storage and distributing plant recently destroyed by fire, and will purchase conveying, elevating, loading and other equipment. Cost over \$50,000. G. A. Maloney is general manager.

◀ WASHINGTON DIST. ▶

Maryland Distillery, Inc., Washington Boulevard, Relay, Md., has asked bids on general contract for six-story addition to distilling plant, 130 x 134 ft., for storage and distribution. Cost close to \$125,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 31 for pipe wrenches, parts for Stillson wrenches, cross-cut saws, carpenters' hammers, 2736 machinists' hammer handles, magnet wire, brass machine screws, switches, split sleeve connectors, chucking reamers, 50 tender-brake shoes for 33-in. diameter cast iron wheels, ship scrapers, automatic cylinder cocks, and other equipment (Schedule 3133).

Annapolis Metropolitan Sewerage Commission, Old High School Building, Annapolis, Md., asks bids until March 31 for steel tank pumping station, two meter

stations and other facilities for extensions in sewer system.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until April 2 for parts for fire trucks, 155 items in all (Circular 115); until April 13, machine and hand tools, including files, hammers, knives, soldering irons, screwdrivers, etc., 146 items (Circular 124).

Norfolk & Western Railway Co., Norfolk, Va., asks bids until April 1 for 2000 cast steel draft yokes, and requirements of couplers and parts for period April 1-June 30 (Contract Serial AA-669 and AA-670).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 31 for sensitive radial drilling and tapping machine (Schedule 7436), one fire pumping unit and oil pump set (Schedule 7431); until April 3, one motor-driven hydraulic press (Schedule 7439), one motor-driven lathe (Schedule 7437) for Eastern and Western navy yards.

◀ SOUTH ATLANTIC ▶

Southern States Oil Co., King and Mount Pleasant streets, Charleston, S. C., has plans for new bulk oil storage and distributing terminal on Ashley River, where site was recently acquired, with initial steel tank capacity of \$50,000 bbl., divided into five tank units, pumping machinery and auxiliary equipment. Cost about \$65,000 with machinery.

Commanding Officer, Ordnance Department, Augusta Arsenal, Augusta, Ga., asks bids until April 1 for machine bolts, brass rivets, screws, galvanized iron nipples, claw hammers, cotter pins and other supplies (Circular 12).

United States Engineer Office, Charles-

ton, S. C., asks bids until March 31 for one portable gasoline-driven arc welding machine (Circular 61).

◀ SOUTH CENTRAL ▶

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until March 30 for aluminum or copper wire and cable for department of electricity for new power transmission line between Wheeler Dam, Ala., and Guntersville Dam, Ala., about 67 miles.

United States Engineer Office, Memphis, Tenn., asks bids until March 31 for three electric generating sets and auxiliary equipment (Circular 243).

United States Engineer Office, Vicksburg, Miss., asks bids until April 9 for 2000 ft. of plow steel wire rope, 3/4-in. diameter, and for 2000 ft., similar wire rope, 3/4-in. diameter (Circular 224); until April 14, one clam-shell bucket, 1 cu. yd. capacity (Circular 227).

◀ SOUTHWEST ▶

Shell Petroleum Corp., Shell Building, St. Louis, has let general contract to P. F. Eller & Co., 111 Stratford Street, Houston, Tex., for new technical and research laboratory at Houston, comprising three buildings, 50 x 160 ft., 28 x 42 ft., and 25 x 50 ft., including machine shop and mechanical department. Cost about \$125,000 with equipment. A. F. Scovill is company architect at Houston.

Board of Supervisors, South River Drainage District of Marion County, Hannibal, Mo., care of John L. Plowman, Hannibal, attorney for district, in charge, asks bids until April 20 for three complete pumping plants for drainage project, comprising Diesel engine-driven pumping units and accessories, pipe lines, trash racks and other structures.

East Texas Utility Corp., Tyler, Tex., plans new transmission and distributing lines in Harrison, Panola, Rusk, Gregg, Marion and other counties, for rural electrification, about 250 miles, including power substation and service facilities. Power supply will be secured from system of Southwestern Gas & Electric Co., Shreveport, La. Cost about \$225,000.

◀ WESTERN PA. DIST. ▶

Viscose Co., Meadville, Pa., manufacturer of cellulose rayon products, has let general contract to Wark & Co., 1608 Walnut Street, Philadelphia, for additions, comprising main six-story unit, 104 x 305 ft., two-story, 268 x 315 ft., and one and three-story, 250 x 335 ft. Cost over \$1,000,000 with equipment. Company headquarters are at 200 Madison Avenue, New York. R. H. Clewson, company mill at Marcus Hook, Pa., is company engineer.

Powhatan Coal & Coke Co., Powhatan, W. Va., plans rebuilding coal tippie at local mining properties, recently destroyed by fire. Loss close to \$50,000 with equipment.

Pure Oil Co., 35 East Wacker Drive, Chicago, plans extensions and improvements in oil refinery at Cabin Creek, W. Va., including additional equipment. Cost over \$80,000 with machinery.

◀ OHIO AND INDIANA ▶

Patterson Foundry & Machine Co., East Liverpool, Ohio, plans to spend immediately \$100,000 in plant expansions. A new building will be erected for manufacture of stainless steel equipment and other products made from special metals. New equipment, including a crane will be installed.

Tuscarawas Metals, Inc., Dover, Ohio, organized to manufacture a line of fabricated steel specialties, has purchased two plants recently vacated by American Sheet & Tin Plate Co. at Dover and New Philadelphia, Ohio, and will improve for new works.

State Department of Prisons, Columbus, Ohio, asks bids until April 6 for three 125-hp. engines and electric generators, with auxiliary equipment, for installation



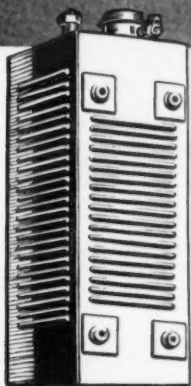
NO ROOM FOR

Prima Donnas

Jitters in the power unit of a materials-handling truck would be inexcusably expensive . . . because one breakdown can cost thousands of dollars in production tie-up. It is not surprising, therefore, that storage batteries power most of the trucks in steel mills—and that more than 70% of these batteries are Edison Steel-Alkalines.

Steel! That, say industrialists, is the proper material of which to build a battery for grueling service. Light in weight, the steel battery uses less of its own power to move its own weight. Strong—steel batteries even survive crack-ups unscathed. Durable—steel batteries use an alkaline electrolyte which is an actual preservative of steel.

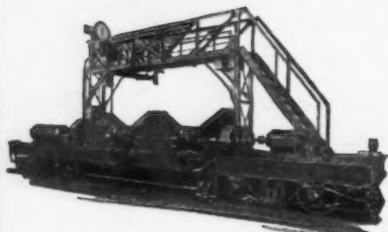
All these qualities add up to Protected Power . . . protection against unexpected failure . . . protection against high maintenance costs . . . protection against gas fumes . . . protection of capital investment. Edison Steel-Alkaline Batteries for every heavy-duty service.



EDISON Storage BATTERY

DIVISION OF THOMAS A. EDISON, INC., W. ORANGE, N. J.

ATLAS CARS



Double Compartment Scale Car with Overhead Operator's Platform. Car provided with Orr Bin Gate Operating Mechanism.



20 Ton Capacity Double Compartment Scale Car for use with Orr type Bin Gates controlled from Operator's Station on Scale Car.

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Gas-Electric and Diesel-Electric Locomotives
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Special Cars and Electrically Operated Cars for every conceivable purpose.

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Engineers - Manufacturers
1140 Ivanhoe Rd., Cleveland, O.

in power house at State reformatory, Mansfield, Ohio. Cost about \$75,000. J. B. Youngblood, State Office Building, Columbus, is engineer.

Union Gas & Electric Co., Fourth and Main streets, Cincinnati, a unit of Columbia Gas & Electric Corp., same address, is arranging fund of about \$4,000,000 for extensions and improvements in power plants and system during next 12 to 18 months, including transmission and distributing lines, power substations and service facilities. Work will begin soon on addition to steam-operated electric generating plant on Second Street, with installation of three high-pressure boilers, stokers and auxiliary equipment, 35,000-kw. turbo-generator unit and other equipment. Building contract for last noted has been let to Ferro Concrete Construction Co., Third and Elm streets, Sargent & Lundy, Inc., 140 South Dearborn Street, Chicago, is consulting engineer.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 20 for 20 12-in. vernier calipers (Circular 663); until April 1, one turret punch with 12-in. throat (Circular 671), two rectifiers, power supply unit, microvolter, etc. (Circular 668), propeller balancing bushings, propeller balancing stand arbors, propeller balancing stand, and 40 knife-edge assemblies (Circular 664); until April 2, 257 steel parallels (Circular 659); until April 3, parts for installation of automatic pilot equipment in airship (Circular 653), 2850 drain cocks and 1000 shut-off cocks (Circular 657), wire brushes and wire brush wheels (Circular 679), 10 airspeed test indicators (Circular 685); until April 6, one gas-fired melting crucible furnace (Circular 669), about 50,000 twist drills (Circular 672), one voltmeter and millivoltmeter (Circular 670), 200 container assemblies (Circular 661).

◀ MICHIGAN DISTRICT ▶

Packard Motor Car Co., 1580 East Grand Boulevard, Detroit, has plans for new one-story foundry. Cost over \$50,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

H. A. Montgomery Co., 17191 Swift Avenue, Detroit, manufacturer of oils, industrial chemicals, etc., has approved plans for new oil refinery at Blue Pigeon, Ohio. Cost over \$200,000 with equipment. Russell Carrothers, Findlay, is engineer.

Challenge Machinery Co., Grand Haven, Mich., manufacturer of printers' machinery and parts, has plans for one-story addition, primarily for a foundry. Cost over \$35,000 with equipment. Pierre Lindhout, Grand Rapids, Mich., is architect.

Jennison Hardware Co., Bay City, Mich., has plans for one-story addition for storage and distribution. Cost about \$45,000 with mechanical-handling and other equipment. Joseph P. Goddeyne, Bay City, is architect.

Ainsworth Mfg. Corp., 2200 Franklin Street, Detroit, manufacturer of automobile stampings and allied equipment, has let general contract to Bryant & Detwiler Co., Penobscot Building, for two additions, four-stories, 80 x 160 ft., and one-story, 110 x 200 ft. Cost close to \$200,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

◀ MIDDLE WEST ▶

Century Vitreous Enamel Co., 6641 South Narragansett Avenue, Chicago, manufacturer of metal-enameled products, has acquired adjoining tract in Clearing Industrial District, for one-story addition, for which plans will be completed at once. Cost close to \$30,000 with equipment.

State Board of Control, State Office Building, St. Paul, Minn., asks bids until April 9 for pumping machinery and auxiliary equipment for new sewage treatment plant at institution at Willmar, Minn. G. M. Orr & Co., Baker Building, Minneapolis, Minn., are consulting engineers.

Bureau of Reclamation, Denver, asks bids until April 2 for bolts, gratings, stair treads, pipe, fittings, etc., for installation in outlet works of Taylor Park Dam, Uncompahgre Project, Colo. (Specifications 776-D).

Independent Refining Co., Laurel, Mont., has approved plans for extensions and improvements in oil refinery, including ma-

chinery. Work will include new vacuum equipment for asphalt production, steel storage tanks and group of towers. Cost about \$125,000. Project will be carried out under direction of Ralph M. Parsons Co., 310 South Michigan Avenue, Chicago.

Omaha Flour Mills Co., Woodmen of World Building, Omaha, Neb., will soon take bids on general contract for new one-story flour mill at Brighton Boulevard and Rickel Road, Denver, for initial capacity of 1000 bbl. a day. A grain elevator will be built with capacity of 350,000 bu. Cost about \$300,000 with mill equipment, elevating, conveying, screening and other machinery. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are consulting engineers.

St. Paul Welding & Mfg. Co., 174 West Kellogg Boulevard, St. Paul, Minn., has let general contract to Perry Swenson, Minnesota Mutual Life Building, for new one-story plant, 40 x 100 ft. Cost close to \$30,000 with equipment. M. A. Wright, 228 Bunker Street, is architect.

◀ PACIFIC COAST ▶

United Concrete Pipe Corp., 1347 West 208th Street, Los Angeles, manufacturer of steel reinforced-concrete pipe, has plans for new one-story plant at North Main Street and Arrow Highway, Baldwin Park. First unit will cost close to \$40,000 with equipment. It is proposed to build other units later.

Consolidated Aircraft Corp., 3302 Atlantic Street, San Diego, Cal., will soon take bids for group of one-story additions, comprising main L-shaped unit, 100 x 450 ft., with wing extension, 100 x 200 ft.; another shop, 50 x 200 ft., and three smaller buildings, 50 x 100 ft., and two 40 x 50 ft. Cost over \$250,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architects and engineers.

Bureau of Reclamation, Denver, asks bids until March 30 for four steel diverter towers and two steel capacitor supports for switchyard at Boulder power plant (Specifications 771-D); until April 6, steel supports, gratings, hand-railings, etc., for lower Arizona and lower Nevada tunnels, same project (Specifications 676).

Sunshine Mining Co., Coeur d'Alene, Idaho, operating silver mining properties, has approved plans for addition to reduction and milling plant, increasing plant capacity to 1000 tons of crude ore daily. Cost over \$350,000 with equipment.

O'Keefe & Merritt Co., 3700 East Olympic Boulevard, Los Angeles, manufacturer of electric refrigerators, gas ranges, parts, etc., has filed plans for one-story addition, 127 x 150 ft. Cost over \$65,000 with equipment. B. E. Anderson, 9129 West Adams Boulevard, Culver City, near Los Angeles, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 31 for files (Schedule 7336); until April 3, one motor-driven coil-winding machine and spare parts (Schedule 7445) for Mare Island Navy Yard.

Bureau of Reclamation, Denver, asks bids until March 30 for one ditch-cleaning and excavating machine, of crawler-traction and endless chain, bucket-digging unit type, for Klamath Project, Klamath, Ore. (Specifications 744-D).

◀ FOREIGN ▶

American Smelting & Refining Co., 120 Broadway, New York, plans new reduction and refining mill at Kildun gold and silver ore-mining properties at Matahuala, Mex. Cost over \$300,000 with equipment.

Fisher Bearing Co., Ltd., Wolverhampton, England, manufacturer of steel ball and roller bearings, affiliated with Kugelfischer, G.m.b.H., Schweinfurt, Germany, has acquired about 174,000 sq. ft. floor space of former local plant of Sunbeam Motor Works, Ltd., and will remodel for new plant. Facilities will be provided for over 400 operatives. Cost about \$150,000 with equipment.

Municipal Council, Belfast, Ireland, plans early call for bids for boilers, stokers, pumping machinery and accessory equipment for expansion in municipal power plant, known as Harbor Power Station. Appropriation of \$860,000 has been authorized for work.

1073 Timken Bearings



In This New UNITED Hot Strip Mill

This new 4-high 43" continuous hot strip mill went into operation recently at the McDonald, Ohio, plant of the Carnegie-Illinois Steel Corporation.

It is a splendid example of modern rolling mill engineering, typifying the trend towards closer rolling tolerances, higher rolling speeds and increased economy of operation.

Timken Roll Neck Bearings were selected for the back-up and work roll necks of the 21" and 45" x 43" 4-high roughing stand, and for the back-up and work roll necks of the 6, 21" and 45" x 43" 4-high finishing stands, a total of 56

bearings being required — 28 back-up and 28 work roll bearings. In addition to these large roll neck bearings, 674 Timken Bearings of various sizes are used in the run-out and approach tables, 162 in the screwdowns and 181 in miscellaneous accessories, making a grand total for the entire mill of 1,073 Timken Bearings.

Timkens' performance record on the roll necks of the world's leading rolling mills — a record not even approached by any other type of roll neck bearing — makes them your wisest choice for new or existing equipment.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN TAPERED ROLLER BEARINGS

THE IRON AGE, March 26, 1936—163

Wise Men of Science

Wise Men of Science—and what a host there are—think of today's achievement as only the stepping stone for tomorrow's discovery. Today's telescope, through which a lighted candle can be seen at a distance of 41,000 miles, gives way to one which will open up undreamed-of worlds tomorrow. Today's alloys, replacing wood and the more unwieldy metals, have brought in the "streamline" and "modern design"; tomorrow, even more effective alloys will take their place. Television—new today, commonplace tomorrow. In every field these modern miracles justify the greatest of all pioneers—the men of science.

Wise Men of Industry are closely akin to the men of science, for they, too, are forward looking, forward thinking men ready to put on a production basis the tested products of the scientific laboratories. In planning for tomorrow's business, they recognize the need for equipping their plants with the most modern and economically operated machinery.

The Wean Engineering Company is a recognized authority in the field of modern plant equipment and its most efficient arrangement.

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